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ABSTRACT

A study is reported in which the effects of 2 competitive treatments on mean classroom performance, interest and retention were examined with the use of a 10-day vocabulary-learning task. Sixty-six 5th grade classrooms were randomly assigned to one of 3 conditions: (1) control; (2) competition with reward; and (3) competition in a game setting. The results indicate that, contrary to prediction, neither performance nor retention was increased under the competitive treatments. However, interest was found to be significantly higher in these treatments than in the control. Finally, and according to prediction, little variability was found between the effects of the 2 competitive conditions on the 3 dependent variables. A model relating task-complexity and motivation to increased performance is proposed and discussed. Several related areas of educational research are suggested, all of which concern aspects of cognitive and affective motivation. (Author/TL)

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Effect of Competition on Performance, Interest, and Retention with the use of a Fifth-Grade Vocabulary-Learning Task

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U.S. DEPARTMENT OF
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PREFACE

The goal of this research project was to effect a merger between classroom teachers and a research team for the purpose of examining an educational problem in a theoretical framework and an applied setting. Sixty-six fifth grade teachers agreed to conduct this two-week research project with their 2,256 students. Observations on ten performance measures, one interest measure, and one retention measure were collected on each S.

The research team analyzed, summarized, and disseminated the findings. They proposed a classroom motivation model (CMM) and suggested additional research for testing and extending the model. The cooperation of educational researchers and teachers presents the strongest hope for developing efficient, economical, and practical solutions to the problems of learning.

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Thanks are extended to each principal, teacher, pupil, research assistant, secretary, consultant, and colleague who cooperated in this study.

ABSTRACT

The effects of two competitive treatments on mean classroom performance, interest, and retention were examined with the use of a 10-day vocabulary-learning task. Sixty-six fifth-grade classrooms were randomly assigned to one of three conditions: control, competition with reward, and competition in a game-setting. It was predicted that the three dependent variables would be significantly higher in the competitive treatments than in the control, but that there would be no significant difference between the two competitive treatments.

Contrary to expectation, neither performance nor retention was increased under the competitive treatments. However, interest was found to be significantly higher in these treatments than in the control ($p < .0001$). Likewise, according to prediction, the two competitive treatments were found to have relatively comparable effects on all three dependent variables.

A model relating task-complexity and motivation to performance-increase was proposed and discussed. The study suggests the need for educational research to (1) clearly distinguish between cognitive and affective motivation, (2) attempt to identify, control, and manipulate the cognitive motivational factors which affect classroom learning, and (3) pursue the study of cognitive and affective motivation in light of their mutual relationship as well as their relative relationship to task-complexity.

Post hoc analyses on individuals suggest that for low ability Ss, competition with others of similar ability may be beneficial in increasing performance. Sex differences on a measure of perceived learning, but not found on actual performance, are speculated to result from different evaluative orientations with respect to academic activities.

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CHAPTER I

INTRODUCTION

Finding answers to learning problems is at least theoretically the business of educational psychology--"That special branch of psychology concerned with the nature, conditions, outcomes and evaluation of school learning and retention" (Ausubel, 1969, p. 232). Procedures for resolving educational issues, however, are strongly debated. Some educational psychologists suggest we look to basic research; others encourage us to direct our efforts toward applied research. A distinction between these methods of investigation and their function has been a topic of frequent discussion (Gilbert, 1962; Hilgard, 1964; Hilgard & Bower, 1966; Cronbach, 1966; Ausubel, 1969; Ebel, 1970; Wittrock, 1970; Melton, 1959).

For Cronbach (1966) the distinction is one of research vs development and dissemination. He decries the "pressure for wholesale dissemination and development activities without the necessary prior research," and argues that such "massive dissemination encourages faddism in education." He also warns against a superficial comparison of one unique method with another--a contrast of two or more innovative techniques without regard to a specified model of behavior. Cronbach looks to the university scholar, "whose first calling is the study of education," and insists it is time to probe for answers to basic problems--to methodically examine, modify, and build educational theories.

Ebel (1970), who claims to be diametrically opposed to Cronbach, views basic research as an activity aimed at "the quantitative formulation of verifiable general laws," and characterized by the "controlled experiment and statistical test used in search for eternal verities." Applied research, on the other hand, is viewed as the "collection of data that promise help in the solution of some immediate practical problem." If one accepts Ebel's definitional distinction there is little reason to question his conclusion, "Basic research in education can promise very little improvement in the process of education, now or in the forseeable future" (p. 46). It seems, however, that he is reacting to the traditional distinction which links applied research with practical utility, and basic research with abstract theory building.

Ausubel (1969) argues for applied research on basic issues. He identifies and evaluates three research orientations used in scientific examination of applied disciplines such as education and medicine. The first is the basic research approach "concerned with the discovery of general laws . . . as an end in itself." He sees its applicability to practical problems as, "quite indirect and unsystematic, and relevant only over a time span which is too long to be meaningful in terms of short range needs of the applied disciplines" (p. 235).

The second approach is extrapolated basic-science research oriented toward the solution of practical problems which are simplified and examined in laboratory settings. The merit of this research method lies in its generation of hypotheses for the applied situation. The danger of this method lies in interpreting the findings as answers rather than suggestions to a practical problem.

The third approach is research at the applied level where "the problems of relevance and extrapolation do not arise." Ausubel claims that since educational psychology is unequivocally an applied discipline, general laws from parent disciplines such as psychology are not applicable and that "separate bodies of applied theory exist that are just as basic as the theory undergirding the parent discipline, but are stated at a lower level of generality and have more direct relevance for, and applicability to the applied problems in their respective fields"(p.238). He attributes the dearth of classroom learning theory to the deficiencies in conceptualization of problems and research design, excessive concern with narrowly conceived academic skills and techniques and the lack of concern for the discovery of general classroom learning principles. The "retreat of educational psychologists from the classroom, their preference for laboratory experimentation, and their preoccupation with measurement and evaluation, personality development, mental hygiene, group dynamics, and counseling" (p. 239) are given as related explanations for the present shortage of applied educational theories.

Ausubel insists that educational psychology cannot "emerge as a viable and flourishing discipline" until research and theory building are directed toward the acquisition of basic intellectual skills which are products of meaningful classroom learning. He emphasizes the importance of distinguishing between these three research orientations (i.e., basic research, extrapolated basic-science research, applied research) and the contribution each can make to the resolution of educational problems.

Wittrock (1970) on the other hand, sees no need for emphasizing what he refers to as artificial distinctions. For him the fundamental issue is to "introduce new methods into research and development studies to obtain understanding and control" (p.43). Melton (1959) is even more explicit: "The first misconception that should somehow be avoided is the notion that basic and applied research are antithetical to each other, and that the knowledge gained by basic and applied research does not join together to constitute the science of learning" (p. 15).

Melton suggests that these methodologies lie on a single continuum in which the experimenter's control of the situation determines the nature of his investigation. He emphasizes that the success and value of a study lie not in having rigid controls per se, but in having answered the intended question or provided evidence for doing so. One's concern must dictate his choice of controls or tolerance for lack of control. This in turn determines the basic vs applied nature of the work.

Hilgard's (1964) discussion of the research continuum implies a similar philosophy. He identifies a six-step process beginning with laboratory research and ending in technological development and adoption. Control of variables is the characteristic distinguishing the steps. Unlike Ausubel (1969), he stresses the importance of relating field studies to theoretical models and laboratory findings.

Whatever differences of opinion educational psychologists have regarding research methodology and terminology, they tend to agree on the need to examine current problems and develop a body of knowledge which allows for generalization. Such consensus, however, is not sufficient to assure productive results. In addition to identifying relevant topics for experimental inquiry, there are at least three issues which educational researchers must consider.

The unit of observation poses a major problem in much educational research. The crux of the problem is independence. Glass and Stanley (1970) distinguish between the experimental and statistical unit of analysis:

> The units of statistical analysis are the data (the actual numbers) that we consider to be the outcomes of independent replications of our experiment. If you will, the units of statistical analysis are the numbers that we count when we count up degrees of freedom "within" or "for replication."
>
> The experimental units are the smallest divisions of collection of experimental subjects that have been randomly assigned to the different conditions in the experiment and that have responded independently of each other for the duration of the experiment.

The authors then argue, "Before valid probability statements can be made about types of errors, these two units must coincide, i.e., the statistical analysis must be carried out on the legitimate experimental units" (p. 505). In cases where classrooms are randomly assigned to treatments the class is the experimental unit and it will usually be necessary to use class means as the unit of statistical analysis. Exceptions to this might be justified if the task is such that there is no reason to believe a dependency among classmates exists, as for example, on a measure of eyelid conditioning under varying intensities of light. Even with such a task, however, if the measure is taken in a group setting a dependency factor is introduced.

Statisticians have logically argued and empirically demonstrated the conditions under which the classroom as opposed to the individual student is the appropriate unit of analysis for examining educational problems (Raths, 1967; Stanley, 1967; Peckham, Glass, and Hopkins, 1969; McLean, 1970). Yet, rare is the researcher that uses a class mean as a single observation. The inconvenience of securing 20 to 40 classrooms for a 2-cell design is one major factor which leads to

the use of an inappropriate unit of observation. But the problems of obtaining a sample do not justify conducting research which because of a dependency factor has little or no generalizability. We must begin to challenge the educational researcher who talks about "significant results" for studies which were never properly designed for probability statements--studies which violate the major assumption of statistical test theory, independence. We must either forego the right to make inferences or adopt a research methodology which qualifies for inferential interpretation. Only if we do the latter can we hope to generate theories or models which can serve as practical guides for teachers.

There are several reasons to believe that marked progress in educational theory building may lie in the realization of a more appropriate sampling procedure. In many cases a researcher will have to secure the cooperation of 20 to 30 times the number of classrooms he formerly used. Teachers will undoubtedly have to be sold on the relevance of the issue being examined. For the experimenter this may mean providing teachers with theoretical explanations as well as possible applications. In turn, the teacher may offer questions, practical suggestions, or criticism. The resulting communication between teacher and researcher is undoubtedly what Marx and Tombaugh (1967) and Mathis (1965) suggest as a prerequisite for substantial improvement in educational theory building.

A second issue of importance to educational research is the use of the teacher vs experimenter for treatment administration. As in the case of specifying the experimental unit, the desired generalizability should determine the procedures for collecting dependent variables. In the early stages of model building a micro-classroom setting and trained experimenter is probably most appropriate and efficient. On the other hand, if the models and theories built by educational psychologists are intended as guides for teachers, we must contend with the variability among teachers and their administration of treatments. Research which entails several classrooms is hardly justified unless it is designed to provide valid and meaningful generalizations for similar settings. This means that for many field studies the teachers will be given the responsibility for treatment administration.

A third problem which the researcher must face is that of empirically defining and justifying "statistical significance." The techniques for manipulating significance via sample size and alpha are well-known. What we need now is a clarification of such manipulations: a statement indicating why a given sample size was used, the difference the experimenter was willing to accept as important, and the power with which he tested this difference (Walster & Cleary, 1970). Perhaps there ought to be a true confession formula for educational researchers which reads something like, "For this experiment the unit of observation was _____; a sample size of _____ was used to test a difference of _____ with an alpha of _____ and a power of _____." Such a statement would suggest the extent to which generalizations could be made, the magnitude of the treatment

effect, and the confidence one might have in a test of significance. A researcher could hardly argue that this is asking too much, for this information is an absolute necessity for a meaningful interpretation of a p value.

The value of educational research is less dependent upon the extent to which experimental control is insured than upon the function the results serve. The methodology and procedure used in this study are basedupon the assumption that the desired generalizability of a study determines the nature of the controls and sample and the treatment specifications.

CHAPTER II

LITERATURE & PROBLEM

The effect of competition in our educational system has been discussed, debated, and "demonstrated" for more than 50 years. Evidence has been gathered, hypotheses have been tested, and conclusions have been drawn only to find that, indeed, a debatable issue had been identified.

One factor which helps account for the dearth of dividends is the use of simplistic comparisons. The competitive environment in education is frequently examined as a simple dichotomous issue in which competition is contrasted with a single noncompetitive situation. These simplistic approaches almost inevitably lead to equally simplistic conclusions:

> . . . it /competition/ is everywhere exalted as one of the prime motive powers in the accomplishment of the world's work (Greenberg, 1932, p. 221).

> Schools which assume the task of helping each student develop an adequate and productive self-concept will understand and take advantage of the tremendous drive of the individual for self-enhancement. In doing so they will find unnecessary the use of competitive marks, contests, and special awards as a means of motivating school work . . . . Any person who is as indiscriminately competitive as many of our schools would encourage him to be is distrusted by adults and by children (Snygg & Combs, 1949, p. 224).

Rather than asking whether competition in education is good or bad, we ought to be considering under what conditions it is profitable or detrimental. Instead of pitting competition and cooperation against each other we ought to be identifying factors and situations which contribute to the effective use of each process. Rephrasing our questions and revising our objectives, however, will not be sufficient to assure a promising program of research.

In addition to reconceptualizing the problem, we must use a theory-building approach; tasks and procedures must be purposefully selected. A meaningful examination of educational competition will require, as Phillips and DeVault (1957) stated, systematic variation of the variables basic to competition (e.g., homogeneity of associates, nature of the task, and relevance of the activity). Only the use of such a theoretical approach will enable us to identify, with efficiency, crucial factors and means for the effective manipulation of these factors. The use of a theoretical framework would also help determine the relevance of previous research findings. For example, studies which examine the effects of competition among

children turning fishing reels (Triplett, 1897), college students pulling corks out of bottles (Stone, 1964), Ss reproducing news print with rubber stamps (Whittemore, 1924), and adults working cancellation tasks (Locke & Bryan, 1967) may acquire a theoretical importance which justifies their apparent lack of practical importance.

A third factor which helps account for some of the apparent contradictions and lack of closure found in competition research is the discrepancy in the definition of terms. For example, a situation identified as "group cooperation" by one experimenter is referred to as "group competition" by another (Hammond & Goldman, 1961). Treatments identified as competitive vary markedly on such factors as task difficulty, task relevance, homogeneity of competitors, use of rewards, and specificity of goals. Some treatments involve competition among individuals; others imply competition among groups each of whose members works cooperatively; still other treatments consist of various combinations of individual and group competition. With such an array of conditions it is not surprising that the literature generates numerous apparent contradictions on the effects of competition.

Oversimplified hypotheses, nonsystematic manipulation of variables, and definitional problems have undoubtedly contributed to our lack of functional theories for educational competition. Attempts to formulate theories in the past have resulted in elaborate and extended definitions rather than models from which predictions could be made, controls established, and explanations offered. Two such descriptive "theories" have been set in a comparative framework in which competition and cooperation were contrasted (Deutsch, 1949b; May & Doob, 1937). Emphasis is placed on differences between processes rather than on clarification of the unique principles of each process.

The detailed theory of May and Doob did not, as they themselves admitted, ". . .attempt to be too precise or to present a conceptual scheme that is logically closely knit" (p. 7). They simply defined motivation as a function of the discrepancy between level of achievement (total sum of individual's present attainment) and level of aspiration (urge or drive to achieve certain goals), explained that either competition or cooperation may be used to deal with this discrepancy, and then proceeded to identify and distinguish between the sociological and psychological parameters of these two processes. Their presentation of 24 propositions and corresponding corollaries is far more descriptive than predictive.

Deutsch (1949a) differentiated between cooperation and competition on the basis of their logical and psychological implications relative to group activity. He defined cooperation as a situation in which the contribution of each participant promoted the goal attainment for all, while he identified competition as a situation in which an individual's progress toward a goal had a proportionally detrimental effect upon the progress of his competitors. His theory is concerned with the group process that emerges as a consequence of

cooperation and competition rather than the effects of these situations on the individual. Thus, neither of these theories enables us to predict behavior accurately under educationally competitive circumstances in which the individual is encouraged to surpass his classmates.

Perhaps a major contribution of these theories was the identification of important variables related to educational competition. Similar contributions have been made by those who have reviewed the literature. Vaughn and Diserens' (1938) "Psychology of Competition" offers an historical perspective. They traced the evolution of the concept and process of competition, categorically reviewed the literature as it pertained to such areas of interest as industry, education, and spontaneous social interaction, and emphasized the importance of identifying the form, intensity, and object of competition in view of a social environment. Mead (1937), taking an anthropological approach, discussed the development and manifestation of cooperation and competition in thirteen cultures. She stressed unique societal influences which modified the nature of these processes.

For all the definitions, descriptions, distinctions, and delineations, there is yet to be formulated a theory of competition for education. But the progress toward that end can undoubtedly be facilitated with a theory-directed program of research designed with full respect for the nature of classroom competition and the assumptions of classical test theory. We must cope with the problems of dependency of observations and irrelevancy of tasks and procedures. In the typical classroom setting students are usually well acquainted with their competitors, familiar with the tasks on which they compete, and recognize the teacher as the indirect or direct initiator and judge of the competition. A marked change in any of these factors may result in the measurement of novelty effects as opposed to meaningful competition effects. Competition among associates implies a greater awareness of the probability of success than does competition among strangers for whom a student has no performance expectation. Competition on a totally unfamiliar task is approached with greater ambiguity than is competition on a familiar task. Teacher- or peer-initiated competition undoubtedly solicits a different response from a competitive situation imposed by an experimenter. In summary, we must study competition in the classroom with a methodology and procedure which justifies the extended use of our findings.

The focus of concern in this study is the effect of educational competition on performance, retention, and task interest. A discussion of the relationship between competition and each of these dependent variables follows.

Competition and Performance

The use of competition with speed-related tasks in an educational setting has repeatedly been shown to increase performance (Chapman & Feder, 1917; Clayton, 1964; Clifford, 1971; Hurlock, 1927; Maller,

1929). On the other hand, Clifford, Cleary, and Walster (1971) found that a competitive treatment had no effect on the performance of fifth and sixth graders taking a power-oriented test (i.e., a power-test or complex problem solving test on which a time limit is imposed). On the basis of two related experiments, Shaw (1958) likewise concluded that competition more easily affected performance on mechanical or skill-oriented tasks than on complex, problem-solving tasks. Basic to all of these studies is the assumption that competition is motivating; the composite results of these studies imply an inverse relationship between the complexity of the task, and performance-increase due to motivational competition. Support for this inverse relationship is provided by theorists who have examined the more general relationship between performance and motivation (Ahlstrom, 1957; Guilford, 1954; Lowell, 1952). A model representing this relationship between task-difficulty and motivated performance is seen in Figure 1; two levels of motivational treatment are presented.

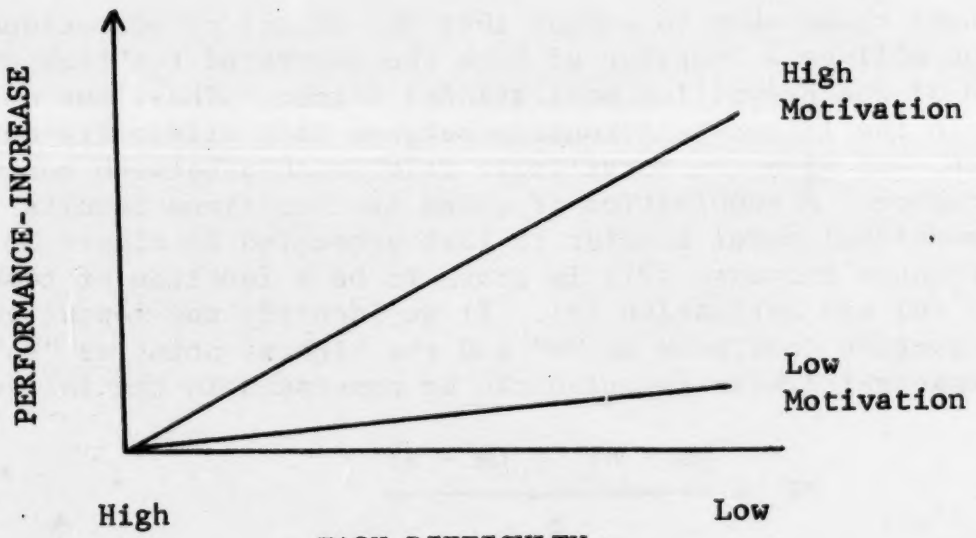


Figure 1 Relation of performance-increase to task-difficulty for two motivation levels.

There is also evidence that the relationship between activation (motivation) and performance is curvilinear (Hebb, 1955, 1958; Lindsley, 1951, 1957; Malmo, 1957, 1958; Schlosberg, 1954; Freeman, 1948; Duffy, 1957; Bruner, Matter, & Papanek, 1955). Atkinson and O'Connor (1966) found that high achievement motivation coupled with extrinsic motivation (e.g., emphasized competition, social pressure) could result in a decrement in performance. Spence et al. (1956), in their Stimulus-Response-Drive theory, also state that in complex learning situations, high drive can be detrimental to performance. A representative model showing a curvilinear relationship between performance and motivation for two levels of task difficulty is presented in Figure 2.

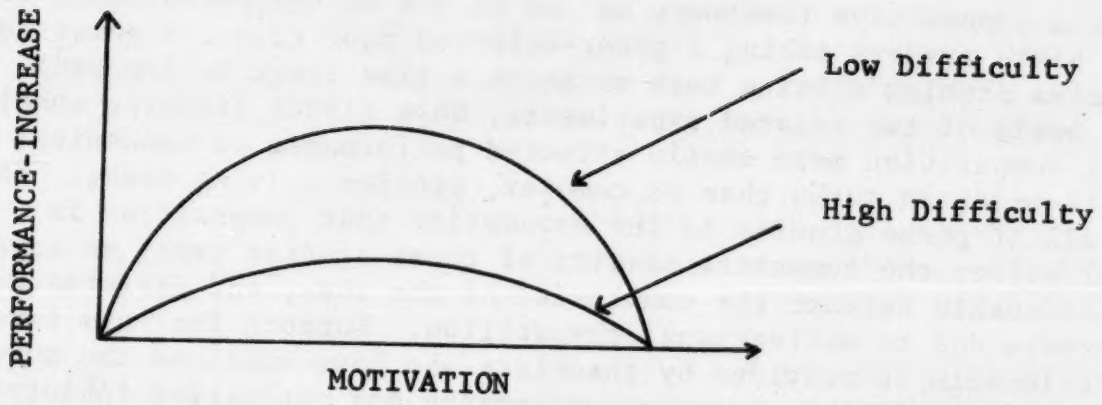


Figure 2 Relation of performance-increase to motivation for two tasks of varying difficulty.

It seems reasonable to expect that the effect of educational competition will be a function of both the nature of the task and the nature of the prevailing motivational forces. Thus, one must contend with the linear relationship between task difficulty and performance, and with the curvilinear relationship between motivation and performance. A combination of these two functions results in a 3-dimensional model similar to that presented in Figure 3. Here performance increase (PI) is shown to be a function of task-difficulty (d) and motivation (m). If we identify the lowest point on the motivation continuum as "a" and the highest point as "b," the performance-increase function can be expressed in the following equation:

$$PI = \frac{(m - a)\quad(m - b)}{d}$$

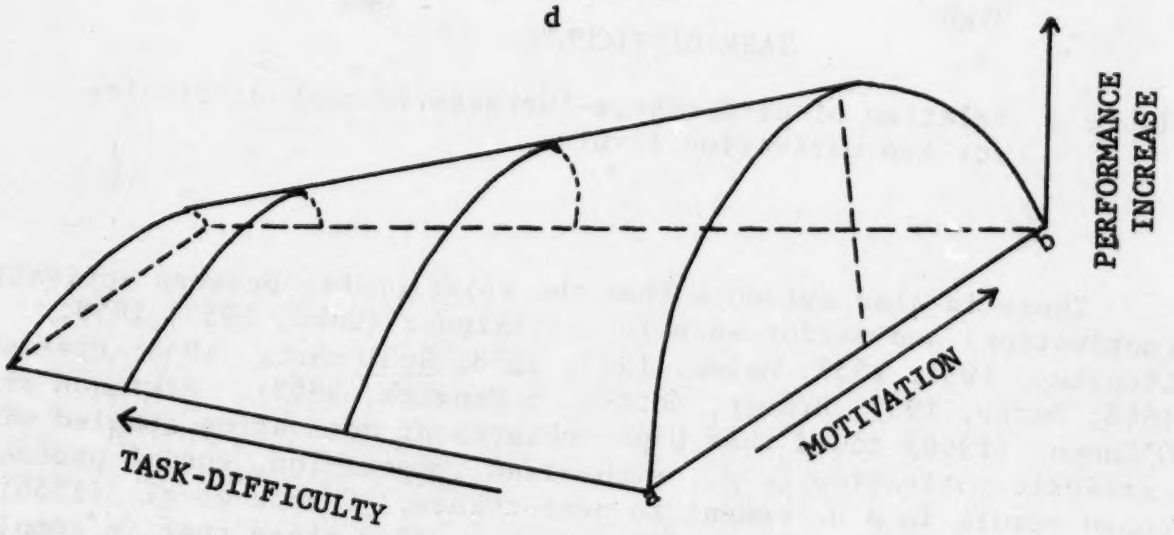


Figure 3 Relation of performance-increase to task-difficulty and motivation.

The task-difficulty dimension in this model represents a continuum in which level of difficulty is varied not only with task content, but also with situational variables (e.g., time to prepare for the task, assistance in preparation, assistance in task performance). Therefore, not only are speed-tasks assumed to be less difficult than power-tasks, but it is also assumed that tasks for which a practice period has been provided are less difficult than tasks for which no practice has been allowed. Thus, for example, in the order of increasing difficulty one might have a speed-test with practice, a speed-test without practice, a power-test with practice, and a power-test without practice.

The motivation dimension in this model suggests an increment in performance-gains as motivation increases from the lowest level to some optimum point, and it suggests a decrement in performance-gains as motivation increases beyond the optimum point. Each point on this continuum represents a composite of intrinsic and extrinsic forces which supposedly elicit, on the part of the S, some degree of motivation. There is no attempt to distinguish between these forces; for, it is very difficult to separate the interrelated motivational components, particularly in the case of a competitive classroom treatment. As Ausubel (1968) pointed out, "although material rewards are often effective, intrinsic (task-oriented) and ego-enhancing motives increasingly tend to dominate the motivational picture . . . . Material rewards also tend to become less ends in themselves than symbols of earned or attributed status and sources of self-esteem" (p. 364).

Two assumptions basic to this motivation continuum and relevant to a discussion of classroom performance are the following: (1) motivation is relatively higher in a formal testing situation (i.e., relatively important task) than in a situation designed primarily for learning, practice, or review activities (i.e., relatively less important task) and (2) motivation is relatively higher in an activity for which a reward is expected than in an activity in which no reward is anticipated. Thus, for example, the motivation accompanying performance on a comprehensive qualifying exam is assumed to be greater than the motivation accompanying the working of a homework exercise; and a task for which a prize is a function of successful performance is considered to be more motivating than a task for which no reinforcement can be expected.

Admittedly, the assumption concerning the effect of rewards can be debated. McCandless (1967) said, "To be completely honest about it, no contemporary psychologist is comfortable when he writes anything conclusive and definite about reward and its effect on behavior" (p. 205). Nevertheless, from a practical viewpoint and with reasonable evidence we will interpret the motivation continuum in the light of the task-importance and reward assumptions.

In relation to this model, research in support of educational competition has focused primarily on the low end of the task-difficulty continuum; when a test representing high task-difficulty was used, competitive motivation was found to have no effect (Clifford, Cleary,

& Walster, 1971). Assuming that most formal education is concerned with improving performance in complex problem-solving tasks rather than motor-skill activities, the value of using competitive motivation in the classroom appears highly questionable. However, there has been too little systematic research to warrant a conclusive statement. Not only has task-selection been narrowly restricted, but competitive treatments appear to be so haphazardly developed and ill-defined that it is difficult even to identify the range on the motivation continuum which has been examined.

Furthermore, even if it were clearly demonstrated that emphasized competition has no direct effect on performance- increase in power testing, it is possible that such motivation applied to a learning activity could indirectly affect final test performance. Competition could function as an incentive in learning: the assurance of a future competitive testing situation may affect the practice or learning period preceding test performance. Thus, given a power task, a specific competitive goal, and a free learning or practice period, one might predict that final performance would indeed be greater in the treatment than in the control condition. For example, let us suppose two randomly selected classes were given an important qualifying achievement test; immediately prior to the exam the members of one class were promised a material reward for superior performance while the members of the other were given no such incentive. Based on the rationale proposed above, there would be little reason to expect a significant difference between class performance for the two groups. However, if these two groups were given a series of weekly review quizzes on content specified in advance, a reward variable may indeed be effective. If one group was assured that the granting of a monetary reward would accompany each quiz, it may not be surprising to find its mean quiz performance higher than that of the other group. The advanced warning in such a process might produce an effect not to be found in a testing situation in which there is no time interval between promise of reward and task performance. Thus, although competitive motivation may have at most a trivial effect on performance-increase in a power-oriented test, such motivation applied to learning, practice, or review activity (as opposed to testing), may have an effect on final performance level.

Competition and Interest

Basic to the above speculations is a two-fold assumption: a competitive situation can arouse and sustain class interest for the duration of the learning task, and classroom learning is a function of interest. Little research has been done on the specific characteristics of a competitive situation which arouse and sustain interest. But there is some evidence for the following four predictions: (1) when competitors are homogeneously grouped on ability, competition with a material reward is more satisfying than competition without the material reward (Clifford & Cleary, 1969; Clifford, 1971), (2) well-defined game-like competition is as effective as reward competition and is preferred to the ambiguously competitive environment that permeates most classroom activities (Clifford, Cleary, &

Walster, 1971; Humphrey, 1967), (3) Ss prefer competitors of similar ability to competitors of very different ability (Strong, 1963; Vaughn, 1936), and (4) pupils work harder under competitive conditions than when working without individual recognition (Ausubel, 1951). Ausubel (1968) stated that ". . .it /competition/ stimulates individual effort and productivity, promotes higher standards and aspirations, and narrows the gap between capacity and performance.... Competition makes group games more interesting and everyday tasks less monotonous" (p. 424).

Indeed, there seems to be a consensus that competition can arouse interest and that different competitive treatments can produce equally effective results. Thus, for example, a competitive situation in which the winner received a reward, and a competitive situation in which the winner was given recognition through a game technique, were found equally effective in arousing interest (Clifford, Cleary, & Walster, 1971). The ability to substitute such treatments may offer advantages in a classroom setting (e.g., the substitution of game techniques for candy rewards may be more economical and efficient--boredom with a single technique can be avoided). However, while assuming that competition can be interest-arousing, there is little certainty as to the relationship between specific components of a competitive treatment and the level of motivation they effect; thus, there appear to be no guidelines for optimizing competitive motivation, developing equally motivating treatments, or clearly specifying what determines the lack of such equality between two treatments.

A positive linear relationship between classroom motivation and classroom learning is one of the more widely accepted assumptions among educators. As a theoretical issue, however, the role of motivation in learning is extremely controversial; positions vary from the assertion that motivation is a prerequisite for learning to a complete denial that motivation is a significant variable in learning. The majority of evidence, nevertheless, seems to suggest that motivation is an important factor, one that facilitates learning although it is not indispensible to it (Ausubel, 1968).

Competition and Retention

In addition to examining the effects of educational competition on performance and interest, it seems reasonable to examine the retention or recall effect. Many learning theorists argue that there is no difference in retention outcomes if material is learned to the same criterion of mastery (Postman & Rou, 1957; Underwood & Richard, 1956). Nevertheless, this opinion is not without exception. Blair, Jones, and Simpson (1968) stated that motivational conditions at the time of learning can either interfere with or facilitate retention. Ausubel (1968) proposed that while cognitive variables (e.g., availability of relevant anchoring ideas, stability and clarity of such ideas, and logical presentation of material) directly influence retention, motivational and attitudinal variables exert an indirect effect on retention by enhancing effort and attention during the

learning process. Similarly, social psychologists argue that factors such as attitudes help determine the rate of recall (Alper & Korchin, 1952; Bartlett, 1932; Levine & Murphy, 1943). Thus one may speculate that retention is a function of personal interest and involvement in the learning process as well as a function of a level of content mastery.

Given the above model and the nature of previous competition research, there is a need to (1) examine educational competition within a learning as opposed to a testing situation; (2) examine competition using an experimental design, task, procedure, and setting which allows for generalization which is of practical educational value; (3) reexamine the effect of educational competition on performance, interest, and retention; and (4) examine the difference between reward and game competition.

This study was designed in light of the four criteria listed above. A ten-day vocabulary-learning situation was identified; a grade-appropriate task was developed; control for a typical classroom environment was insured; the classroom was used as the unit of observation; performance, interest, and retention measures were taken; and a reward-competition and game-competition treatment were used in addition to a control.

On the basis of the proposed model, its rationale and the related assumptions, two predictions for each of three variables (i.e., performance, interest, and retention) were made:

1. Competition is more effective than noncompetition when applied to a power-oriented task under a learning condition.
2. Game competition is as effective as reward competition when applied to a power-oriented task under a learning condition.

CHAPTER III

METHOD

A two-week vocabulary learning task was developed to be administered under three conditions in relatively typical classroom settings: each class was left intact for all treatments; the regular teacher served as the E; and the project was presented to the pupils as a routine learning unit. To minimize the effect of marks, assumed to be a dominant motivational factor in education, students were told that their scores would not be used for report cards or any permanent record.

The three conditions were as follows: Control (C)--a relatively noncompetitive treatment in which no specific score comparisons among classmates were made. Reward (R)--a competitive treatment in which score comparisons among students were made daily and were accentuated by the rewarding of candy Life-Savers to high-scoring Ss. In each classroom, four homogeneous groups were formed prior to the experiment. The teacher ranked all students according to reading ability and then divided the class into four equal-sized groups. Group membership was constant throughout the experiment; the high scoring member in each group received a reward on the basis of a day's performance. Game (G)--a competitive treatment in which score comparisons among homogeneous competitors were made daily and were accentuated in a follow-up game activity. Four groups per classroom were formed on the basis of teacher rankings, as in the Reward condition. The two highest scoring Ss in each group received an advantage in the game, TABS, which was played immediately after the daily vocabulary task was scored.

Sample

From the population of 62 Milwaukee elementary schools having at least 80% white enrollment, 68 fifth grade teachers, representing 48 schools, volunteered to have their class participate in this study. Of these, 66 teachers were randomly chosen for the final sample. The number of Ss from whom data were collected totalled 2,256; thus, there was an average of 34 students per classroom. Mean classroom IQ, taken from school records, ranged from 90 to 114. Of the 66 classrooms there were only two in which either sex comprised less than 45% of the enrollment.

Materials

Materials required for the ten-day vocabulary-learning task included study lists, word quizzes, answer key, teachers' manuals, opinion sheet, challenge words, tie breakers, game boards, record forms, follow-up test, and rewards. Samples of these materials are included in the Appendixes. The nature and purpose of these items were as follows:

Teachers' Manuals--Sets of instructions for each of the three treatments explaining how the vocabulary-learning task was to be conducted, scored, and recorded.

Study List--A list of 20 vocabulary words suggested for home-study in preparation for a Word Quiz to be administered the following day.

Word Quiz--10-item multiple-choice vocabulary test for which the key words were taken from the corresponding 20-word study list distributed on the preceding day.

Answer Key--List of correct responses for Word Quizzes.

Tie Breaker--Two additional items per day used in the Reward treatment to break ties within homogeneous groups.

Challenge Word--The additional word per day which high-scoring Ss in the Game condition could choose to define. A correct response on the challenge word yielded a bonus point, while failure on the item resulted in the loss of a previously earned point.

Game Board--12" x 12" cork board used for student identification and score recording in the Game condition.

Opinion Sheet--A three-item instrument used to measure S task-interest following the completion of the final Word Quiz.

Follow-up Test--50-item instrument (compiled by randomly selecting five items from each of the 10-word quizzes) used to obtain the retention measure two and a half weeks after the final Word Quiz was administered.

Record Forms--Sheets on which teachers identified Ss by ability group, indicating sex, IQ, and daily performance.

Rewards--Candy Life-Savers awarded daily to high-scoring Ss in the Reward condition; a member from each of the four ability groups within a class was awarded a roll on the basis of each day's performance.

The Word Quiz was the most important single instrument and was constructed in the following way: 140 vocabulary items were prepared in multiple choice form with five one-word options accompanying each key word. This pool of items was administered as a series of tests over a four day period, to approximately 200 sixth and seventh grade students. An item analysis was then performed and the 100 most discriminating items were selected and ranked according to the level of difficulty as reflected by the X_{50} coefficient (Baker, 1969). After subdividing the ordered list into ten levels, one item from

each level was randomly selected and a ten-point vocabulary quiz was compiled. This procedure was repeated until all 100 items were used and ten quizzes had been developed.

The 40 original items not used in the word quizzes were modified to serve as Tie Breakers and Challenge Words which were needed for the Reward and Game conditions.

Procedure

Classroom teachers, as the assistant experimenters, assumed full responsibility for administering all instruments. Teachers' Manuals provided general and specific directions for each of the three treatments. The basic procedure for administering the vocabulary-learning task was standard across treatments: each of ten consecutive days children in all three treatments received a 20-word Study List; the day after they received a list, Ss were given a quiz on ten of the 20 words; Ss exchanged and scored each other's papers immediately after completing a quiz. The differential treatments were administered on the basis of these daily quiz scores: in the control condition the papers were simply returned to the Ss; in the Reward condition candy Life-Savers were awarded to the winning Ss; in the Game condition Ss played TABS--a game which emphasized the rank ordering of players based on their performance. The game rules for TABS and the details of these three treatment procedures may be found in the Teachers' Manuals (see Appendix page 61).

Immediately after the tenth and final quiz, the 3-item interest measure was administered (Appendix p.88) Two and a half weeks later the experiment was concluded with the administration of the 50-item follow-up test.

No attempt was made to conceal from teachers or students the fact that this vocabulary-learning task was being conducted in three different ways through the city. On the contrary, the Teachers' Manuals suggested explanations and replies which could be used in the event that students inquired about such differences.

Design and Analysis

A one-way multivariate design allowing for the three treatments (i.e., Control, Reward, and Game) and the three dependent variables (i.e., performance, interest, and retention) was used for this experiment. Two planned comparisons, directly related to the major predictions, were used to test the joint effect on all three dependent variables. The first planned comparison examined the difference between the control condition and the conbined competitive treatments (Control vs Reward and Game). The second planned comparison examined the difference between the Reward treatment and the Game treatment (Reward vs Game).

Differences of interest were specified in terms of Δ, a ratio of a mean difference to the within-cell standard deviation (Walster

& Cleary, 1970). A power of .9 against a Δ of .5 with a conventional significance level of .05 was considered desirable. However, this would have required a sample size of 309 observations (i.e., classrooms). Since only 66 observations were available, there was considerably less power than appropriate.

Therefore, we followed a procedure that allows rational inference when sample size is fixed (Walster & Cleary, 1970). Two power curves were determined for the 66 observations. The first power curve was chosen to pass through a point representing a power of .9 at a Δ of .5. This curve resulted in a critical value of .375; if the observed F statistic was greater than this, we would made the decision that the effect was large. (The probability of correctly saying the effect was large would be at least .9). With this first power curve, however, the Type I error rate was .67--a clearly unacceptable value.

A second power curve was chosen to pass through a point representing a power of .05 against a Δ of .125. This second power curve resulted in a critical value of 3.14; if the observed statistic was less than this, we would make the decision that the effect was at most trivial. (The probability of correctly saying the effect was trivial would be at least .95).

For an observed F statistic between .375 and 3.14 we are left with contradictory conclusions: the effect was both large and small. In this region, therefore, we must suspend judgment. But if the observed statistic is less than .375, we can say with confidence that the effect was not large; if it is larger than 3.14, we can say with confidence that the effect was large.

CHAPTER IV

RESULTS

The results of the analyses of variance are summarized in Table 1. The multivariate test for the planned comparison between the control and the combined competitive treatments resulted in $F = 10.04$; $df = 3,61$; $p < .0001$. Only one of the three corresponding univariate analyses for the dependent variables resulted in significance. In accordance with prediction, the competitive treatments significantly increased interest. However, contrary to prediction, neither performance nor retention were noticeably improved with the use of these treatments.

TABLE 1

Multivariate and Univariate Analyses of Variance
for Two Planned Comparisons on Three Dependent Measures

	df	MS	F	p
1st Planned Comparison				
(C vs R & G)	3/61		10.04	.0001
Performance	1/63	.54	.64	.43
Interest	1/63	4.70	29.24	.0001
Retention	1/63	4.01	.18	.67
2nd Planned Comparison				
(R vs G)	3/61		.84	.47
Performance	1/63	.002	.00	.96
Interest	1/63	.37	2.32	.13
Retention	1/63	1.47	.07	.80

The planned comparison between the Reward and Game treatments resulted in a multivariate $F = .84$; $df = 3,61$; $p < .47$. In accordance with prediction there was no difference between the effects of Reward and Game competition on performance, interest, or retention. Treatment means and standard deviations for each of the three dependent measures are presented in Table 2.

TABLE 2

Treatment Means for Performance, Interest, and Retention

Treatment	Dependent Measures		
	Performance	Interest	Retention
Control	5.72	2.41	30.85
	1.14	.16	5.84
Reward	5.92	2.63	31.55
	.88	.16	3.94
Game	5.90	2.57	31.19
	.69	.13	4.05

Means over standard deviations

Figure 4 shows the mean performance on the 10-word quizzes for each of the three treatments. Although the control treatment is lower than both of the competitive treatments for nine of the ten days, the difference is indeed trivial; on the average the daily within-cell standard deviations were approximately 1.0 while the average daily difference between control and treatment performance was less than .2.

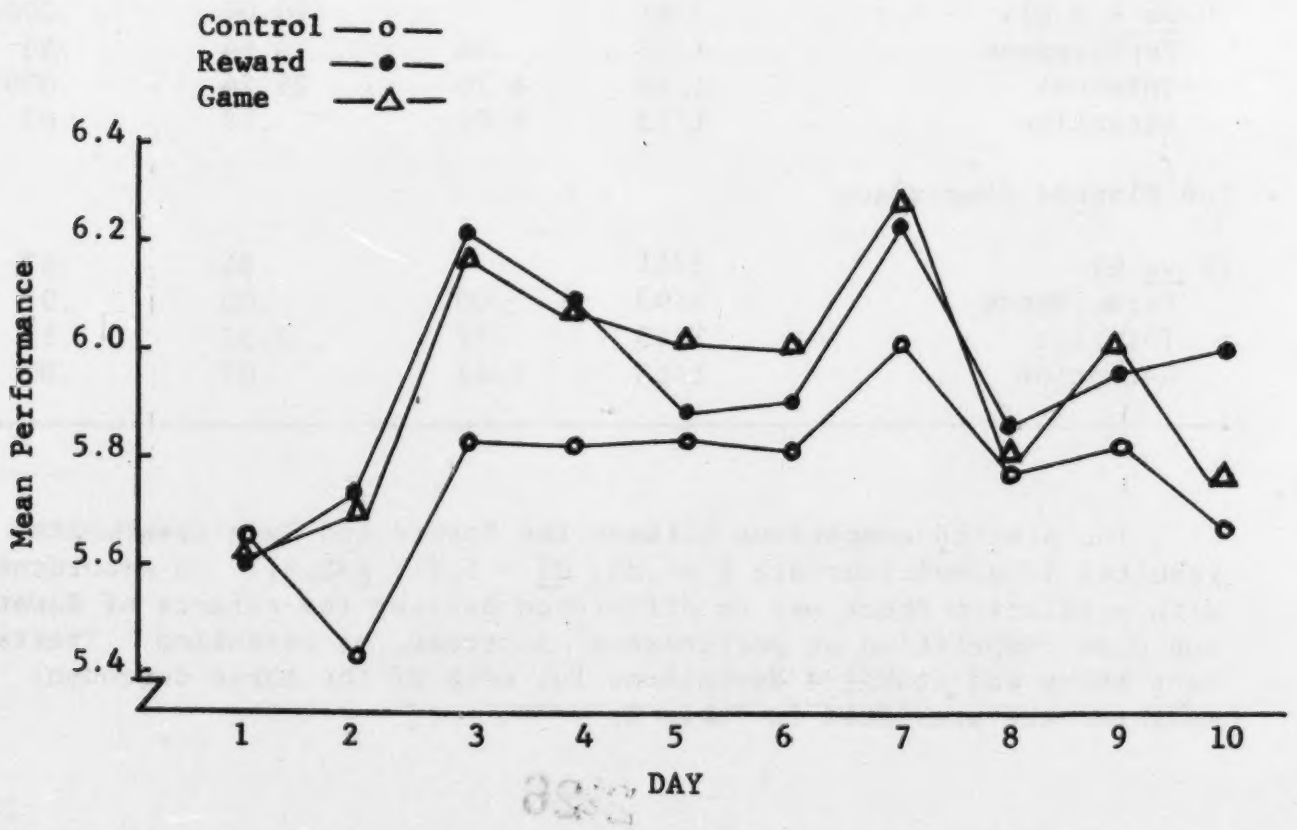


Figure 4 Mean Performance on a Set of 10-Item Word Quizzes Administered Under Three Conditions.

The pooled within-cell correlations between the dependent variables, sex, and IQ were computed and the results were as follows: performance and interest showed a correlation of -.09; performance and retention correlated .88; and interest and retention had a correlation of -.10. Only very small correlations were found between any of these dependent variables and sex. IQ showed relatively high correlations with performance and retention, but it was found to have a -.12 correlation with interest. These correlations are presented in Table 3.

TABLE 3

Pooled Within-Cell Correlations for Dependent Measures, Sex, and IQ

	Sex 1 = M, 2 = F	IQ	Performance	Interest	Retention
IQ	.07				
Performance	-.08	.75			
Interest	.01	-.13	-.09		
Retention	.05	.77	.88	-.10	1.00

Table 4 shows the pooled within-cell correlations for the ten daily quizzes. None of the 45 coefficients is below .80; over 70% of them are .85 or higher. The means for the 10-item quizzes in the control condition ranged from 5.4 to 6.1, while the within-cell standard deviations ranged from 1.0 to 1.4. Thus, there is little reason to question either the parallelism of the ten measures or their reliability.[1]

To examine sex and ability group differences, analyses were performed using individual student observations as opposed to class means.[2] Unfortunately, the retention measure had only treatment and classroom identification and, thus, could not be used for the following analyses. The interest measure obtained from the opinion sheet was analyzed separately for each of the three items. For although items 1 and 2 (i.e., "I think this 10-day word-building task was: ...." and "This is how I feel about this word-building task: . . . .") appear to be similar in meaning, the third item (i.e., "How many new words do you think you learned with this 10-day word-building task?") attempts to measure perceived learning which may be distinct from liking. In the following analyses, the first two items of the opinion sheet will be referred to as "liking-opinions" ($LK\text{-}O_1$ and $LK\text{-}O_2$) and the last one as "learning-opinion" (LRN-0).

TABLE 4

Pooled Within-Cell Correlations for 10 Daily Quizzes

DAY	1	2	3	4	5	6	7	8	9	10
2	.88									
3	.90	.89								
4	.89	.87	.92							
5	.85	.86	.88	.89						
6	.84	.82	.87	.90	.87					
7	.85	.85	.89	.92	.88	.89				
8	.80	.80	.84	.86	.87	.81	.84			
9	.82	.86	.89	.90	.89	.87	.90	.90		
10	.81	.83	.82	.86	.88	.83	.87	.86	.89	1.00

Table 5 shows the results of the univariate analysis for treatment by ability. While ability is a significant factor in performance and LRN-0, there is no significant difference between ability groups on the liking-opinion measures. On the other hand, treatment is significant ($p < .001$) for LK-0_1 and LK-0_2 but not for performance or LRN-0. There are no significant interactions.

TABLE 5

Univariate Analyses on Individual Students

Source	Variable	MS	F	p
			df, 2/2107	
TREATMENT				
	Performance	61721.63	2.04	.13
	LK-0_1	18.46	49.00	.001
	LK-0_2	17.72	52.20	.001
	LRN-0	0.71	2.41	.09
			df, 3/2107	
ABILITY				
	Performance	6958090.00	229.76	.001
	LK-0_1	.68	1.80	.14
	LK-0_2	.37	1.09	.35
	LRN-0	1.89	6.42	.001
			df, 6/2107	
TREATMENT				
BY	Performance	19979.30	.66	.68
ABILITY	LK-0_1	.15	.39	.89
	LK-0_2	.67	1.96	.07
	LRN-0	.21	.70	.65

Table 6 gives the means and standard deviations on these variables for the four ability groups by treatment. The ability groups are Low (L), Low Average (LA), High Average (HA), and High (H).

TABLE 6

Means and Standard Deviations

Ability Group	Treatment	N	Variable			
			Performance	LK-O_1	LK-O_2	LRN-O
L	Control	182	40.7	2.3	2.3	2.5
			15.4	.7	.6	.6
	Reward	163	45.4	2.6	2.5	2.5
			17.9	.6	.7	.5
	Game	175	43.5	2.6	2.6	2.6
			18.2	.6	.5	.5
LA	Control	176	54.0	2.3	2.3	2.6
			16.8	.6	.5	.5
	Reward	172	55.5	2.6	2.7	2.7
			17.8	.6	.5	.5
	Game	179	53.5	2.5	2.5	2.6
			17.7	.7	.6	.6
HA	Control	175	61.1	2.3	2.4	2.6
			18.0	.6	.6	.5
	Reward	179	61.9	2.7	2.7	2.7
			18.0	.6	.5	.5
	Game	184	61.5	2.6	2.6	2.6
			16.6	.6	.6	.5
H	Control	180	69.8	2.4	2.4	2.7
			16.8	.6	.5	.5
	Reward	181	70.4	2.7	2.7	2.7
			16.7	.5	.5	.5
	Game	173	70.7	2.5	2.5	2.6
			18.9	.6	.6	.5

Means over standard deviations

Figure 5 shows the mean performance for each of the four ability groups by treatment. As expected, a linear trend results in all three conditions. Figure 6 shows the mean of the two LK-0 scores for each ability group by treatment. A comparison of Figures 5 and 6 clearly suggests that although there is a linear trend for performance, there is no identifiable trend for liking by ability.

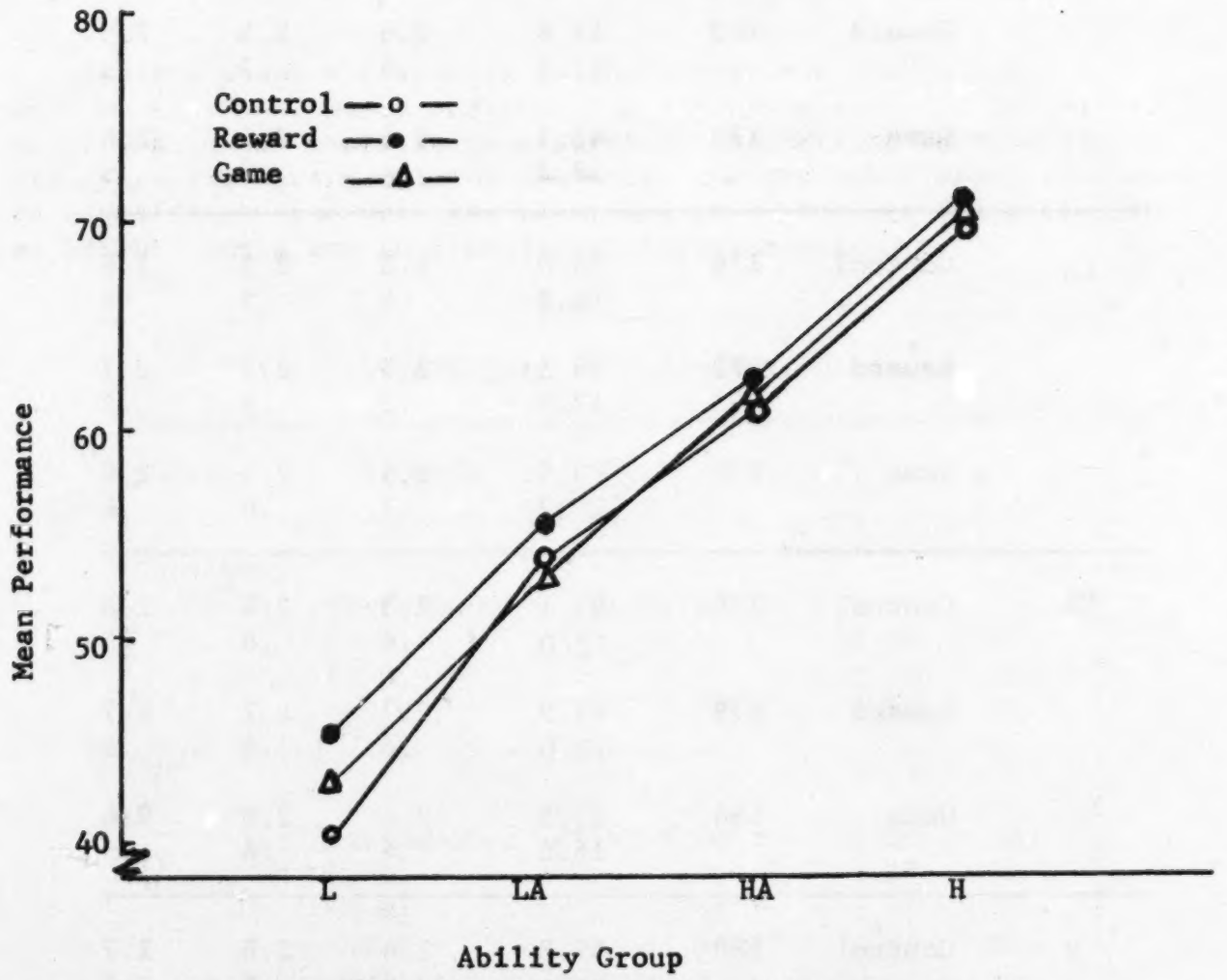


Figure 5 Mean Performance of Ability Group by Treatment

Figure 7 shows the LRN-0 scores for the four ability groups. The slight linear trend for this measure of perceived learning suggests the nature of the significant difference resulting from the analysis of variance. It is interesting to note that perceived learning or LRN-0 tends to be higher under R condition than under either the C or G condition.

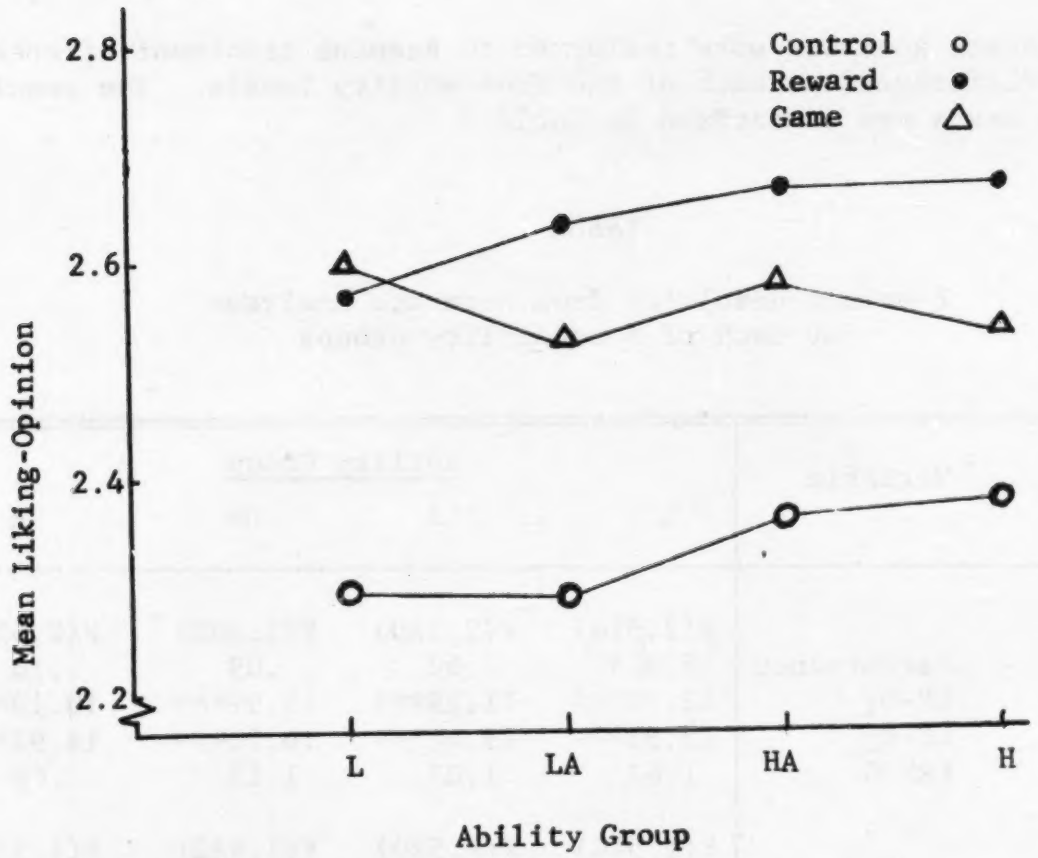


Figure 6 Mean LK-O of Ability Group by Treatment

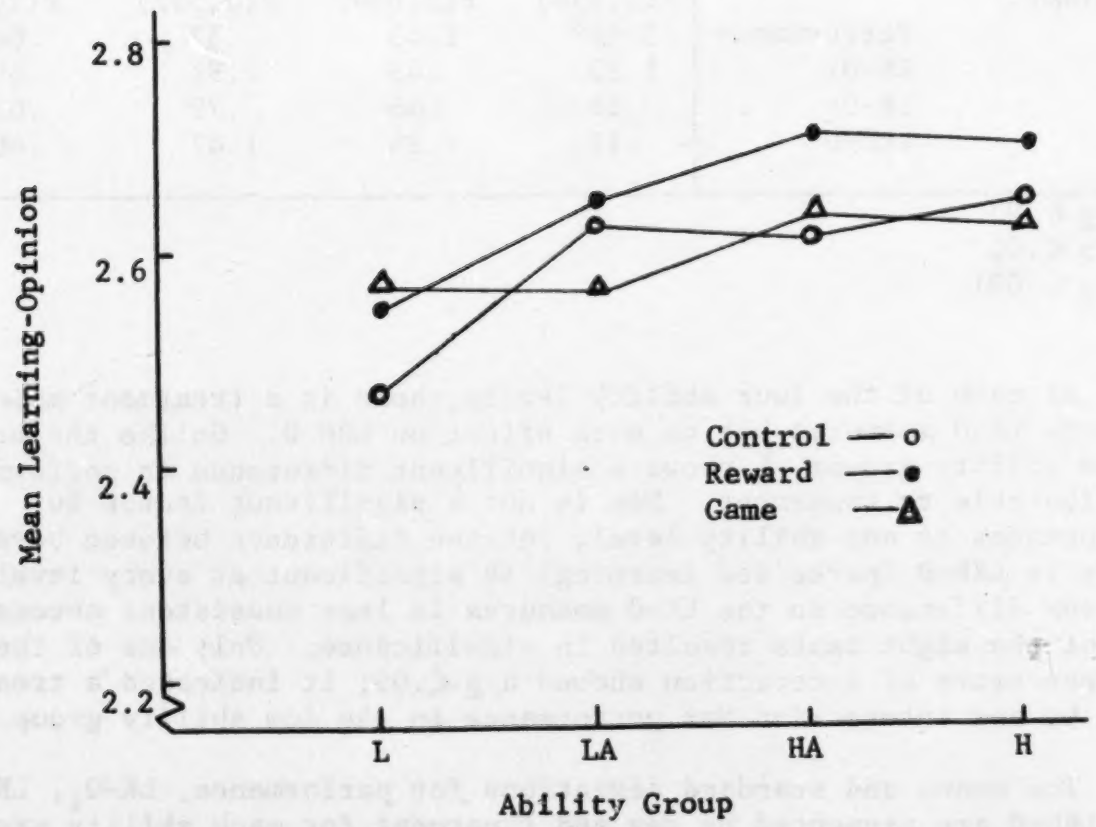


Figure 7 Mean Learning Opinion of Ability Group by Treatment

Separate analyses were performed to examine treatment effects and sex differences at each of the four ability levels. The results of these tests are summarized in Table 7.

TABLE 7

F-values Resulting from Separate Analyses for Each of Four Ability Groups

Source	Variable	Ability Group L	LA	HA	H
Treatment		F(2,514)	F(2,520)	F(2,532)	F(2,528)
	Performance	3.31*	.62	.09	.10
	LK-O_1	12.76***	11.29***	15.92***	10.19***
	LK-O_2	13.35***	19.46***	10.71***	14.97***
	LRN-O	1.67	1.03	1.13	.69
Sex		F(1,514)	F(1,520)	F(1,532)	F(1,528)
	Performance	1.36	.03	1.17	.75
	LK-O_1	2.08	3.03	2.45	.45
	LK-O_2	4.00*	1.64	10.63***	1.36
	LRN-O	9.15**	10.09**	6.76**	12.68***
Treatment by Sex		F(2,514)	F(2,520)	F(2,532)	F(2,528)
	Performance	3.58*	1.43	.57	.04
	LK-O_1	1.23	.45	2.81	.69
	LK-O_2	.16	.46	.79	.01
	LRN-O	.11	.25	1.47	.40

*$p < .05$
**$p < .01$
***$p < .001$

At each of the four ability levels there is a treatment main effect on both LK-O measures but no such effect on LRN-O. Unlike the other three ability groups, L shows a significant difference in performance attributable to treatment. Sex is not a significant factor in performance at any ability level, yet the difference between boys and girls in LRN-O (perceived learning) is significant at every level. The sex difference on the LK-O measures is less consistent across groups; two of the eight tests resulted in significance. Only one of the sixteen tests of interaction showed a $p < .05$; it indicated a treatment by sex interaction for performance in the low ability group.

The means and standard deviations for performance, LK-O_1, LK-O_2, and LRN-O are presented by sex and treatment for each ability group in Table 8.

TABLE 8

Means and Standard Deviations by Sex

Ability Group	Treatment	Sex	N	Performance	LK-O_1	LK-O_2	LRN-O
1	Control	M	115	40.5/15.9	2.2/.7	2.3/.6	2.4/.6
		F	67	41.0/14.6	2.4/.7	2.3/.6	2.6/.6
	Reward	M	101	46.4/19.3	2.6/.6	2.5/.7	2.5/.5
		F	62	43.7/15.5	2.6/.7	2.6/.6	2.6/.6
	Game	M	108	40.7/15.9	2.5/.6	2.6/.5	2.5/.5
		F	67	48.0/20.6	2.6/.6	2.7/.5	2.7/.5
2	Control	M	94	55.5/16.3	2.2/.7	2.2/.5	2.6/.6
		F	82	52.2/17.3	2.3/.6	2.3/.5	2.7/.5
	Reward	M	84	54.8/19.4	2.6/.6	2.7/.5	2.6/.6
		F	88	56.2/16.2	2.6/.6	2.7/.6	2.7/.5
	Game	M	91	52.3/18.1	2.4/.7	2.5/.7	2.5/.6
		F	87	54.9/17.3	2.6/.5	2.5/.6	2.7/.5
3	Control	M	76	61.5/17.3	2.3/.7	2.3/.7	2.5/.5
		F	99	60.8/18.5	2.4/.6	2.5/.5	2.7/.5
	Reward	M	85	60.6/16.9	2.5/.6	2.5/.6	2.6/.5
		F	94	63.1/19.0	2.8/.5	2.7/.5	2.8/.5
	Game	M	92	60.0/16.8	2.7/.6	2.5/.6	2.6/.6
		F	92	63.0/16.3	2.6/.6	2.6/.6	2.6/.5
4	Control	M	69	69.3/17.8	2.4/.6	2.3/.6	2.5/.5
		F	111	70.2/16.2	2.4/.6	2.4/.5	2.7/.4
	Reward	M	92	69.8/16.4	2.6/.6	2.7/.6	2.6/.5
		F	89	70.9/17.0	2.7/.5	2.7/.5	2.8/.4
	Game	M	83	69.7/20.1	2.5/.6	2.5/.6	2.6/.6
		F	90	71.6/17.7	2.6/.6	2.5/.6	2.7/.5

Mean over standard deviation

Figure 8 shows mean performance of boys and girls by ability and treatment. Figure 9 indicates the nature of the treatment effect on the LK-0 and LRN-0 measures. Boys and girls at all four levels of ability express greater interest in the R and G conditions than in the Control. In all three conditions and at all four ability levels, girls judge the personal learning value of the task to be greater than boys.

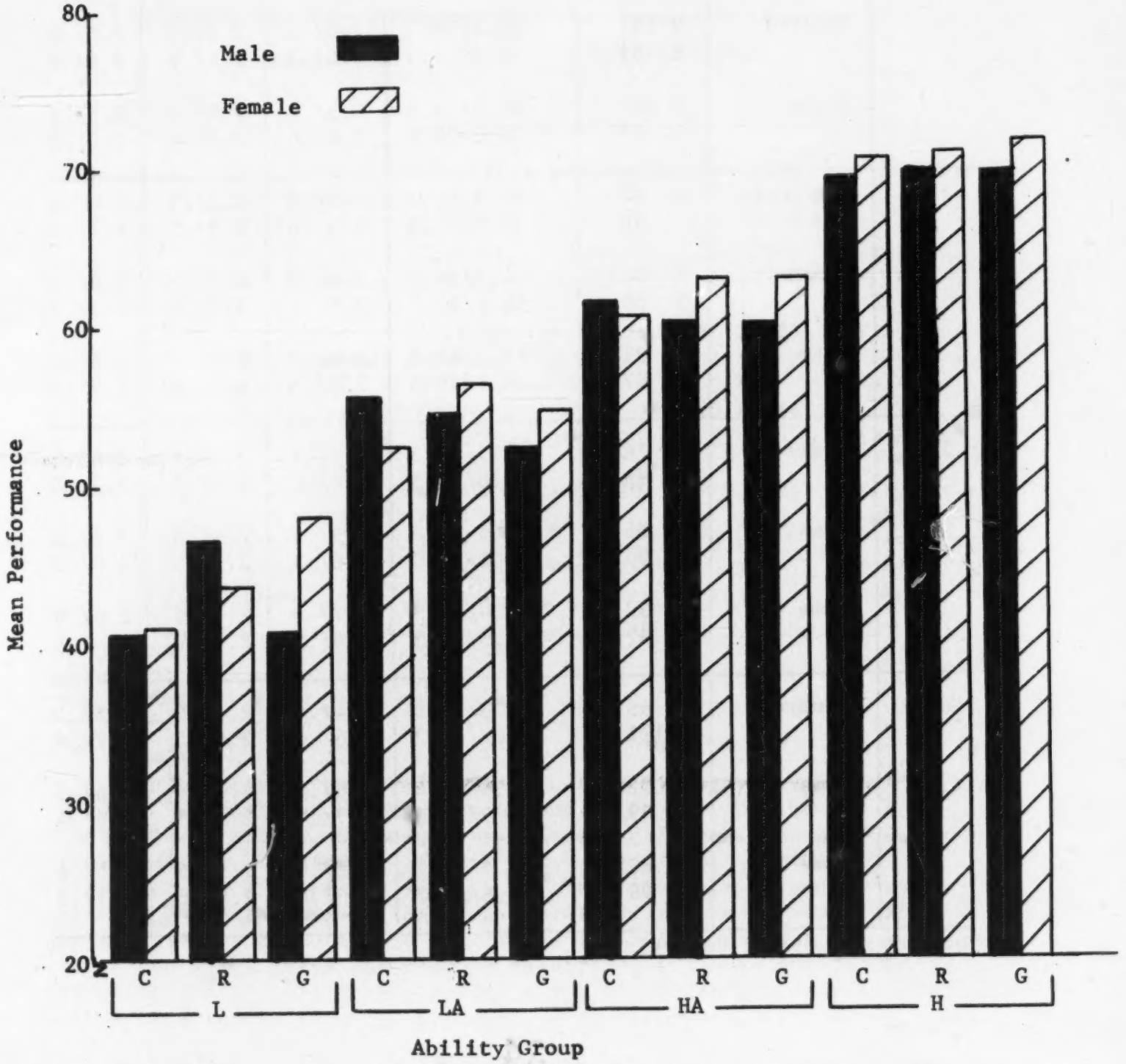
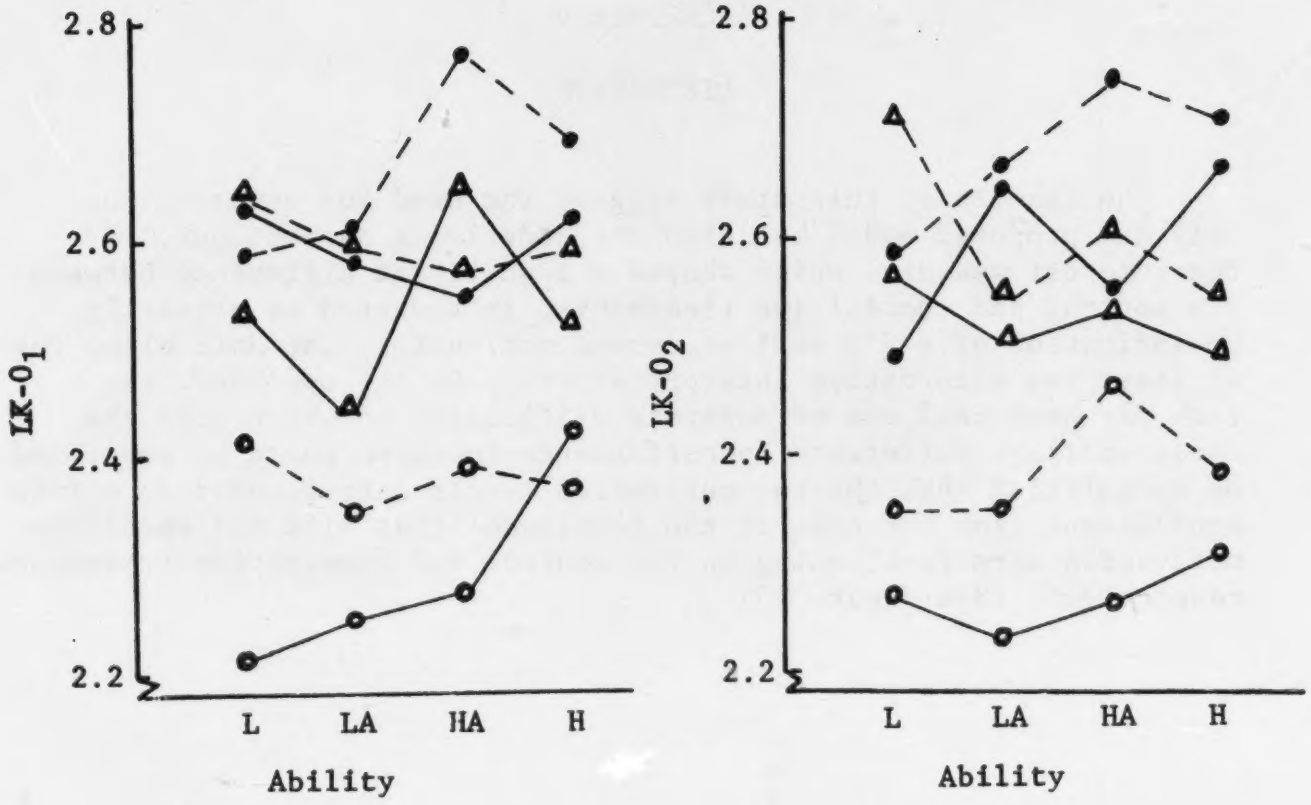


Figure 8 Mean Performance of Ability by Treatment for boys and girls



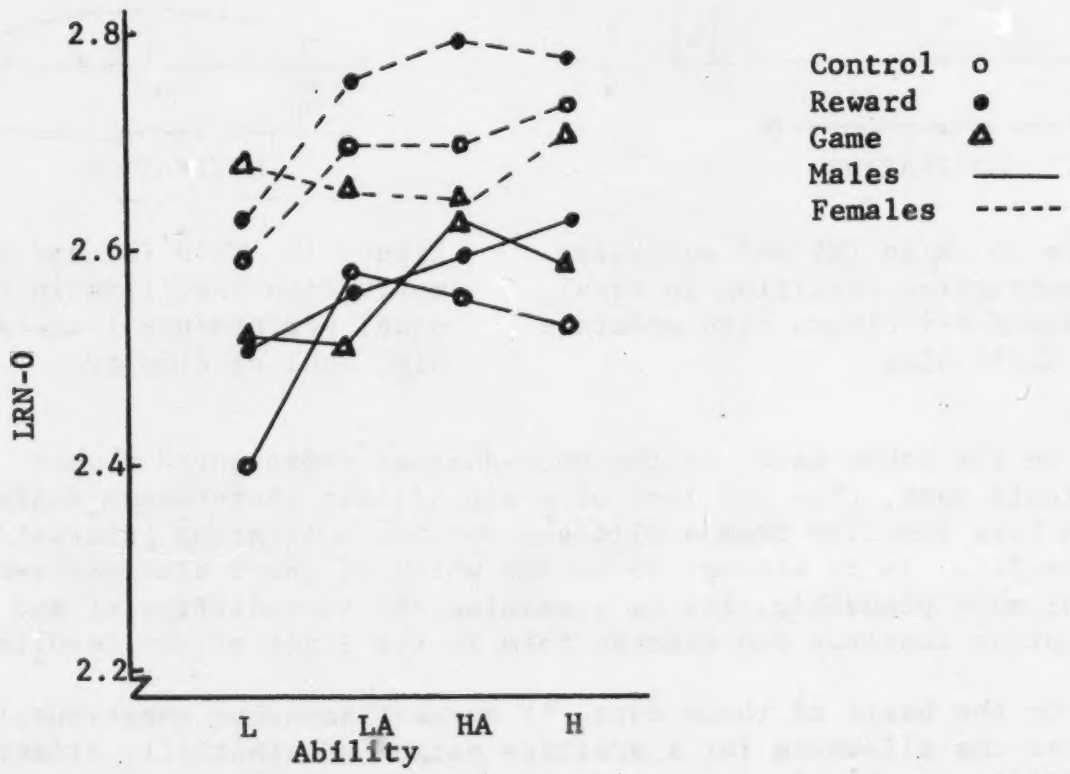


Figure 9 Mean LK-O_1, LK-O_2, LRN-O for three Treatments by Ability for Boys and Girls

CHAPTER V

DISCUSSION

The results of this study suggest the need for revising not only the proposed model but also the underlying assumptions. If the interest measure, which showed a significant difference between the control and competitive treatments, is accepted as primarily an indication of a S's self-expressed motivation, the data allow for at least two alternative interpretations. On the one hand, the task may have been one of moderate difficulty, in which case the nonsignificant difference in performance-increase could be explained by speculating that the two motivation levels corresponded to points equidistant from the ends of the continuum--that mild and excessive motivation were functioning in the control and competitive treatments respectively (See Figure 10).

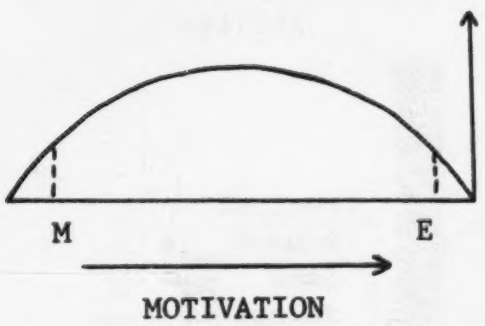


Figure 10 Mild (M) and excessive (E) motivation resulting in equal performance-increase with moderate task difficulty.

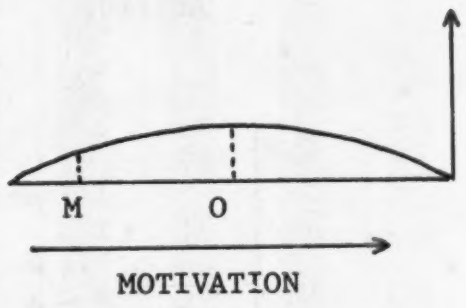


Figure 11 Mild (M) and optimum (O) motivation resulting in relatively equal performance-increase with high task difficulty.

On the other hand, if the word-quizzes represented a very difficult task, then the lack of a significant performance difference could have resulted from a mild and optimum motivation contrast (See Figure 11). In an attempt to decide which of these alternatives is the more plausible, let us reexamine the task-difficulty and motivation continua and discuss them in the light of our results.

On the basis of these data, it appears somewhat questionable whether the allowance for a practice period substantially affects the difficulty level of a power-oriented task. This study showed that performance-increase remained severely restricted in spite of an apparent difference in motivation (i.e., interest). The task-difficulty dimension might more appropriately be identified as a "task-complexity" dimension in which the nature of the task per se

determines its placement on the continuum; situational variables (e.g., practice, use of references) probably play a relatively minor role in the manipulation of the difficulty level of the task. At least in retrospect the vocabulary-learning task used in this experiment seems to be representative of an activity near the high end of the task-difficulty continuum--perhaps very close to the same task administered under circumstances in which no home-study or practice period was provided. In order to have effectively and substantially reduced the level of task-difficulty for this word-building exercise, it seems that the task itself would have to be altered (e.g., provide definitions for words or reduce the number of words on the study list). Thus, in the revised model we will use task-complexity as a dimension in which the nature of a task per se is the major determinant of the degree to which the task is identified as difficult.

The motivation continuum of the model also appears to be in need of modification. The manipulation of motivation in this experiment was attempted through competitive treatments which included daily awarding of Life-Savers or the playing of TABS; the interest variable was assumed to reflect a measure of motivation. Admittedly the interest measure was somewhat crude and could possibly be interpreted in several ways. One might speculate that the significant difference on interest can be attributed to the winning Ss in the competitive treatments. However, the correlations between performance and the LK-0 measures were examined for each ability group separately, and these 8 correlations ranged from .00 to .09. Thus it appears that Ss definitely prefered the competitive treatments regardless of ability group or their performance rank within their group.

One might question whether the significant difference between the control and competitive treatments may have simply reflected a preference between undesirable alternatives, resulting in a relative measure of "disinterest" or lack of motivation as opposed to "interest" or motivation. This explanation seems somewhat unlikely, however, because the mean interest scores fell between 2.4 and 2.6 on a scale in which 3.0 was the maximum and indicated, for example, that the task was "very interesting and lots of fun." Thus, we are fairly confident that interest was a measure of a relatively positive as opposed to a negative attitude. In addition, there seemed to be no reason to believe that either the Reward or Game treatment represented over-stimulation or excessive motivation.

With evidence suggesting that task-difficulty was relatively high, and that the interest-ratings were an indication of a favorable increase in motivation due to the competitive treatments, one is led to interpret the results of this study according to the diagram presented in Figure 11 as opposed to that presented in Figure 10. Obviously, such an interpretation presents a rather dismal picture for the potential effectiveness of educational motivation based on competitive techniques. Indeed, one is led to speculate that performance increase can be affected only on relatively simple tasks, which in fact become increasingly less important as one advances in the educational program (e.g., penmanship, copying from a chalkboard, following an art pattern).

An alternative speculation seems to require a revision of the motivation component in the model. Admittedly motivation usually involves a composite of elements which, particularly in an educational setting, becomes extremely difficult to specify, much less control. It was for this reason that in the originally proposed model, motivation was conceptualized as a single though admittedly a very complex function. However, we have now decided that there is a definite need to distinguish between types of motivation and to then identify the type of classroom or educational task for which each kind of motivation is most effective. In deciding the breakdown of motivation we were to use, we established three criteria: 1. Categories which were relatively mutually exclusive 2. Categories which were based upon widely accepted distinctions 3. Categories which were identifiable and recognizable in classroom learning situations.

Our first consideration was that of intrinsic vs extrinsic motivation; it appears to be one of the most common distinctions. Bruner (1966) defined an intrinsic motive as "one that does not depend upon reward that lies outside the activity it impels" (p. 114). He suggested curiosity as a prototype of the intrinsic motive, but also included the drive to achieve competence, the aspiration to emulate a model, and the urge to reciprocate--"to respond to others and to operate jointly with them toward an objective." Such intrinsic motives are the determinants of learning; or as Bruner said, "The will to learn is an intrinsic motive, one that finds its source and its reward in its own exercise" (p. 127). An extrinsic reinforcement--punishment, threat, promise, praise and blame--is identified as one which "...may indeed get a particular act going and may even lead to its repetition, but it does not nourish, reliably, the long course of learning by which man slowly builds in his own way a serviceable model of what the world is and what it can be" (p. 128). Thus while extrinsic motivation may affect performance, performance is dependent upon learning, which in turn is primarily determined by intrinsic motivation.

Perkins (1969) made a similar distinction between intrinsic and extrinsic motives and recognized that an extrinsic motive is heavily dependent upon an intrinsic motive.

> Teachers, then, have a wide choice of incentives: externally controlled incentives such as reward and punishments, intrinsic incentives such as the student's own need for achievement and self-enhancement,...Although externally controlled incentives (rewards and punishments) are relatively easy to establish and administer and thus are widely used... such incentives are most effective when they are linked with intrinsic incentives (p. 66).

Marx and Tombaugh (1967), who appear to be in agreement with Bruner and Perkins, contended that increased performance resulting from material reinforcers assumed previous learning. That is,

extrinsic motivation can facilitate optimum performance but does not directly increase ability. In summarizing the literature on the effects of incentive shifts, they pointed out that "overshooting" (i.e., sudden acceleration in performance) and "undershooting" (i.e., sudden decrease in performance) resulting from a shift in magnitude of reinforcement does not occur during early training but rather during later training. Thus, once again the effect of extrinsic reinforcement appears to be dependent upon an established level of learning.

Although the distinction between intrinsic vs extrinsic motivation appears to be a relatively common one, we could find no operational definitions for such a dichotomy which would be adequate for our purpose. For, while it is reasonable to classify a candy bar awarded in a competitive treatment as an extrinsic motivator, it is difficult to classify a treatment such as competition-without-reward (Clifford, Cleary, and Walster, 1971) as either an intrinsic or extrinsic motivating force. Competition may well change the very nature of the task (i.e., intrinsic motivation)--at least as perceived by an individual S. Yet it is often only a circumstantial variable superimposed on the task (i.e., extrinsic motivation). To associate intrinsic motivation with factors which have a direct effect on performance and extrinsic motivation with factors having an indirect effect on performance, as Marx and Tombaugh do, seems equally inadequate for our purposes. It only introduces the need to operationally define "direct" and "indirect."

Although Ausubel (1968) mades a distinction between intrinsic and extrinsic motivation which is not dissimilar to those discussed above, he also makes a distinction between "cognitive" and "motivational and attitudinal" variables. In this distinction he seems to set cognitive drive apart from other intrinsic motives such as "curiosity tendencies and related predispositions to explore, manipulate, understand, and cope with the environment." He views these latter predispositions as having "potential rather than actual motivational properties, and .../as being/ nonspecific in content and direction."

> ...They impinge catalytically and nonspecifically on the cognitive interactional process, by enhancing effort, attention, and immediate readiness, without affecting any of its basic parameters (for instance, the availability of relevant appropriate subsumers; the latter's stability, clarity, and discriminability from the learning task). Hence, they neither determine any of its qualitative attributes, nor differentially influence dissociability strength apart from a non-specific facilitating effect on learning (p. 370).

Thus, Ausubel emphasizes the importance of recognizing not only a distinction between intrinsic and extrinsic motivation, but also a distinction between intrinsic motives which are cognitive vs those which are attitudinal.

The distinction between cognitive and attitudinal or affective motivation is even more pronounced in Piaget's theory. For Piaget, the distinction between the cognitive and the affective components of motivation appears to be as mutually exclusive as an intrinsic-extrinsic contrast, (Flavell, 1963) while Ausubel's distinction between cognitive and attitudinal motivation is a subdivision within the component of intrinsic motivation.

Aware, on the one hand, of the overwhelming complexity of motivation and the limitation of imposing any discrete classification upon a variable for which multifacet continua are more appropriate, and convinced on the other hand, of the need to make some distinction for the purpose of meaningful analysis, we decided upon a cognitive vs affective classification.

For a classroom setting this distinction seems to be relatively more applicable than an intrinsic-extrinsic or direct-indirect contrast. There are specific things a teacher can and does do with objects, comments, and methods. At times his manuevers have the primary intent and function of simply arousing interest, gaining attention, winning good will. At other times the teacher uses materials, techniques, or procedures for the sole purpose of making the task more understandable, relating it to relevant concepts developed previously, placing the task in a developmentally sequential setting to insure successful performance. The former would exemplify the use of affective motivation, the latter cognitive motivation.

In view of the distinction between cognitive and affective motivation it is important to recognize that in our previous competitive treatments the affective motivational component is predominant. In line with both Ausubel's and Piaget's distinction between cognitive and affective variables the use of a competitive technique may at best have only an indirect or secondary effect on learning. Furthermore, the magnitude of such an effect would be heavily dependent upon cognitive variables (e.g., knowledge of content, quantity and quality of relevant associations) which are independent of the extrinsic components of the competitive technique per se. Thus, unless great care is taken to assure the presence of such essential cognitive motivational components, the effect of competition or similar factors which function primarily as affective motivators would be, perhaps, at most trivial.

Thus, in addition to the revised task-difficulty dimension of the model (in which difficulty is defined in terms of the complexity of the task per se), we revised the motivation continuum in order to distinguish between cognitive and affective motivation. The revised model shows performance-increase as a function of task-complexity and these two types of motivation. The new model presented in Figure 12 suggests that : 1. Cognitive motivation (Mc) becomes increasingly effective as task-complexity (TC) increases, 2. Affective motivation (M_a) becomes decreasingly effective as task-complexity increases, and 3. Cognitive motivation becomes increasingly effective as affective motivation becomes decreasingly effective. If we

identify the ends of the affective and cognitive motivation continua, a_1, a_2 and c_1, c_2 respectively, the function for the classroom motivation model (CMM) in terms of performance increase (PI) can be expressed in the following equation:

$$PI = \frac{(M_a - a_1)\ (M_a - a_2) + TC(M_c - c_1)\ (M_c - c_2)}{TC}$$

An assumption basic to the model is, as task-complexity increases, the potential for cognitive motivation also increases. The relationship between task-complexity and the relative effectiveness of cognitive and affective motivation suggests that while only a limited amount of cognitive motivation is associated with a non-complex task, a noticeable performance-increase can be generated through affective motivation. On the other hand, any significant performance-increase on a highly complex task will be dependent upon the effective use of cognitive motivation.

In view of the typical power-oriented or problem-solving tasks which students usually encounter in the classroom, the model suggests the need to examine the effects of cognitive motivation used in applied classroom settings.

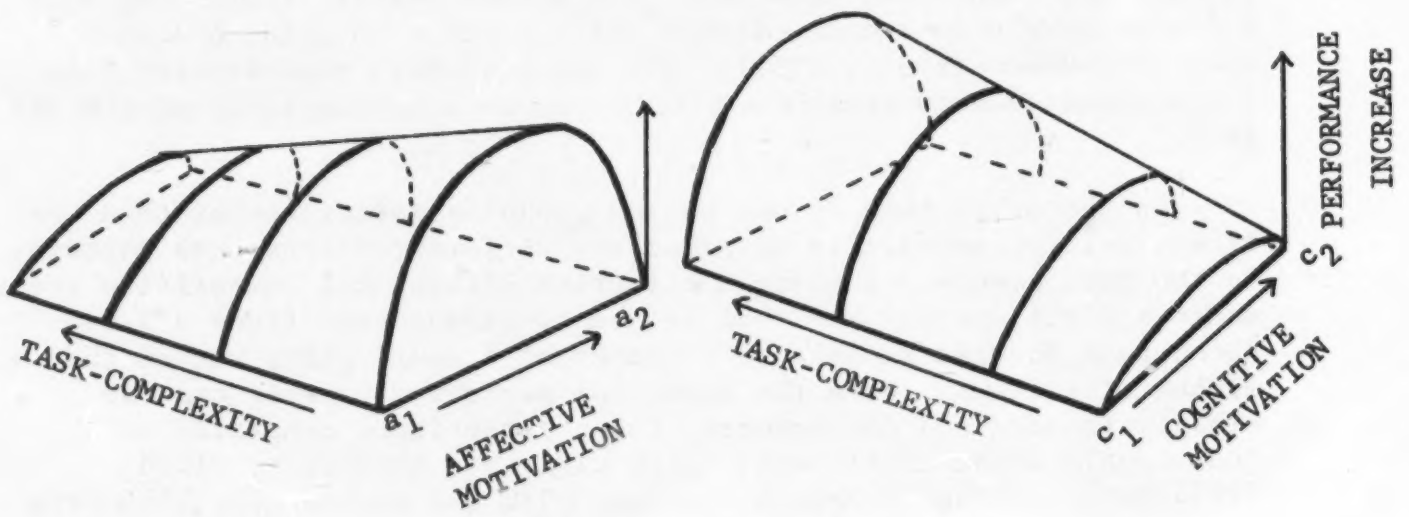


Figure 12 Relation of Performance-Increase to Task-Complexity and Cognitive and Affective Motivation.

However, it is not sufficient just to acknowledge the importance of White's (1959) competence theory or Piaget's moderate novelty principle (Ginsburg & Opper, 1969) or Berlyne's (1960) curiosity motive. Educational researchers must attempt to systematically examine the effects of such cognitive motives. This implies the manipulation of cognitive motives. Admittedly, the extent to which such motives can be developed, controlled, and manipulated is debatable. However, two points of concern appear evident: (1) learning of complex tasks is heavily dependent upon cognitive motivation, and (2) too little applied educational research has been conducted to preclude the possibility of effectively manipulating factors which have a major influence on cognitive motives.

In addition to looking at a class as a whole (a priori analysis) our data suggests a need for looking at levels of ability within a class (post hoc analysis). Our revised model makes no attempt to account for performance-increase as a function of ability level for several reasons: (1) our evidence of differences between levels is too limited and speculative, (2) ability grouping results in varying degrees of homogeneity and results based on one grouping technique tend to have little generalizability for another ability group situation, (3) we did not find that our post hoc analysis on individuals offered evidence which contradicted our general model.

The significant difference in performance for the LA group was a post hoc finding, which may have any of several possible explanations: It may be that Ss in low ability groups are more susceptible to direct reinforcement (e.g., candy and games) than those in the higher groups. It has been found that lower SES Ss are more readily influenced by, and more likely to choose, direct reinforcement (Higgins & Archer, 1968; Zytkoskee et al., 1969). (It has also been demonstrated that low academic achievement is a fairly common characteristic of low SES Ss.)

On the other hand it may be the grouping factor rather than the direct reinforcement that elicited the differential response patterns in the four groups. A major distinction between the competitive treatments and the control was that in the treatment conditions a S was encouraged to view himself as a member of a small group rather than a member of a class. Thus the number of perceived competitors was clearly reduced and furthermore, these competitors consisted of individuals whose skills were quite similar. Studies by Floyd, (1954) Berkun, (1966), Morgan & Stucker, (1960) and Hambourger, (1964) have shown that homogeneous ability grouping does increase performance of low ability Ss. Such grouping increases their probability of "winning" or achieving relative success. In our study, for example, a S in the low ability group had between 7 and 9 competitors of approximately equal skill rather than an entire class of competitors, many of whom had much greater skill than he. At the same time, ability grouping has somewhat a reverse effect for Ss in the highest ability group: they likewise compete against only those of comparable ability with the result that failure (that is, relative failure) is more likely to be experienced and more readily perceived.

Another possible explanation for the increased performance under competitive treatments in the low ability group is simply the effect of regression toward the mean: Ss in the lowest ability group had the most room for improvement.

The explanation for this low-ability performance increase may be some combination of these factors: direct reinforcement (with its special appeal for low ability Ss) coupled with the increased probability of success gives such Ss the incentive to expend a great amount of effort in learning, and since they are members of the lowest group, they have the most possibility of improvement.

The significant interaction for performance between sex and treatment in the low ability group may be a function of reinforcement. Girls, who performed best in the game treatment, might be more concerned with status or class ranking while boys, who did best under the reward condition, may prefer material reinforcement. Evidence for this sex difference in reinforcement is provided in a study by Witryol, Tyrrell, & Lowden, (1964). Differences between boys' and girls' performance in R and G conditions at the other ability levels tend to show either no sex preference for treatment or one similar to that found to be significant for the L group.

These findings and hypotheses are not in conflict with the proposed model. Low ability Ss would be expected to show a greater performance increase if the task were less difficult than the present one, and on more difficult tasks the direct reinforcements would tend to be less effective. Thus, as task complexity increases one could still assume that cognitive motivation would be more necessary and that the function of affective motivation would become relatively less important.

A sex difference which is perhaps of greater importance than the one just discussed is that resulting from the LRN-0 measures. At all four ability levels girls perceived themselves to have learned more than boys did. This would be less surprising if girls had actually performed superior to boys (which, incidentally, is the typical expectation for a verbal task such as that used in this study). One may be tempted to explain this difference in perceived learning by suggesting that girls are more concerned about giving the socially desirable response. But that becomes less viable when one recalls that boys did not hesitate to express a high degree of interest (i.e., LK-O_1 and LK-O_2). The fact that boys and girls did not significantly differ on performance at any of the four ability levels, and the fact that only 2 of 8 tests for sex difference on the LK-0 measures were significant, makes the difference on LRN-0 all the more provocative.

One might speculate that boys are more objective evaluators of their learning skills; and that self-evaluation of girls reflects level of aspiration rather than level of achievement. On the other hand, girls may have a greater tendency to view school work as a productive activity than do boys. Boys may be pessimistic or biased

about the extent to which learning activities are of benefit to them and this may generate a sense of futility. Although studies by McGuire (1961), Berk, Rose, & Stewart (1970), and Tennenbaum (1944) showed that girls are more interested in school, our findings suggest a need to distinguish between the emotional and evaluative factors which are frequently combined in measures of interest.

There seems to be no way in which our present data can offer us a more substantial explanation for this sex difference in perceived learning. But our results do offer rather impressive evidence that boys and girls at several levels of ability evaluate their educational achievements differently--even when there is no difference in the absolute value of these achievements. As a factor in motivation, perceived success may well outweigh the importance of actual success. The former might also outweigh the importance of emotional satisfaction (LK-O). Thus, this post hoc finding should definitely be experimentally reexamined.

CHAPTER VI

SUMMARY AND IMPLICATIONS FOR EDUCATION

Emphasizing competition in a fifth grade vocabulary-learning task significantly increased Ss' self-expressed interest but nad no effect on their performance or retention. A comparison between a competitive situation in which high-scoring Ss were awarded candy Life-Savers and a competitive situation in which high-scoring Ss received an advantage in a follow-up scoring-game showed that both procedures were equally effective as measured by all three dependent variables (i.e., performance, interest, and retention).

A prevalent idea among educators today is that competition is not good for students--it upsets them and produces an atmosphere unconducive to learning. However, in this experiment Ss expressed a liking for the treatments--both of which were definitely competitive. In the typical classroom-learning situation there is, without a doubt, implicit competition. It may be beneficial to reduce the heterogeneity of competition by controlling for ability and to offer students the possibility of making competition explicit rather than ambiguous. Social comparison is a process commonly used by both children and adults to establish their self-concepts and evaluate their behaviors. Competition is one means of social comparison--a means to which students may be less adverse than educators.

The results of this study also emphasized the need to distinguish between cognitive and affective motivation and the corresponding need to examine systematically classroom learning in the light of this distinction. This implies the need to identify, measure, and assess those cognitive and affective variables which, in an educational setting, significantly contribute to the motivation factor. Task-complexity appears to be another critical variable to be considered in examining the effects of educational motivation: The nature of the task might well serve as an important determinant for selecting motivational techniques.

On the basis of previous research on competition, the results of this experiment, and a review of motivation theories, a performance-increase model was proposed. It suggests a linear relationship between task-complexity and the relative importance of affective and cognitive motivation. The model indicates that cognitive motivation becomes increasingly important as task-complexity increases, that affective motivation becomes decreasingly important as task-complexity increases, and that affective motivation becomes increasingly important as cognitive motivation becomes decreasingly important.

According to psychologists such as Ausubel, Piaget, and Bruner there is little question that such factors as prior associations,

sequencing, task-relevance to past experiences, and use of advanced organizers facilitate learning. However, the "acid test" is whether modifications of these and similar cognitive factors in a typical applied educational setting confirm such theorizing. All too frequently nonsignificant results in field research elicit such criticisms as "Your sample size was too small," or "You had too many extraneous variables and inadequate control." Such comments, however, may be more indicative of shortcomings in an "educational" theory than inadequacies in the given study. For the validity of a learning theory which admittedly generalizes only to situations as stringently controlled as that in a laboratory, must be challenged.

Education is a social activity; tolerance and respect for individual differences must be reflected in the model building and theorizing of educational psychologists as well as in the teaching procedures of educators.

This necessitates the synthesis, modification, and rebuilding of laboratory-oriented theories in applied settings--a task requiring patient, step-by-step investigations. Combining several theories or factors into an applied model and immediately testing all dimensions of that model is likely to result in much uninterpretable information. Thus, the CMM proposed in this study will not be examined in one single comprehensive experiment designed to confirm or obliterate the model. It is admittedly a tentative basis, intended to be studied one dimension at a time, and continuously revised in light of each additional study conducted in the field. If models and theories cannot be built to withstand the individuality of educators and differences between classroom procedures, there is reason to question whether they should be built at all.

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FOOTNOTES

[1]On a similar sample of 5th graders the estimated KR-20 for the performance measure (based on the 100 items administered over the 10-day period) was .96.

[2]For these supplementary analyses there is no longer a clearly interpretable relationship between power, alpha and number of observations. Furthermore, the dependency of individuals within a class makes any results extremely tenuous. Therefore, the interpretation of these analyses must be considered as no more than a possible base from which to speculate and design future experimental studies; no conclusive conclusions may be drawn from such post hoc analyses.

APPENDIXES

INSTRUCTIONS FOR TEACHER EXPERIMENTERS FOR PROJECT GAME IV

INTRODUCTION

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2. Ten sets of yellow QUIZ SHEETS, one set for each of the ten days.
3. One set of IBM answer sheets; a student uses the same answer sheet for all ten days.

4. One Master Record Sheet.

(Check your materials and call if there is anything missing.)

PROCEDURE

Step 1 a. Divide your students into four equal-sized groups on the basis of general reading ability. You do not need to consult any past records in making this decision; your judgment based on observation is accurate enough. Make the groups as equal in size as possible. For example, if you have 31 students you should have groups of 8, 8, 8, and 7. Call your lowest group 1; your second lowest group 2; the next group 3; and your best group 4. On the Master Record sheets list the members of each group beginning with the lowest group (1); use one page for each group and put names in alphabetical order writing LAST name first. Fill in the name of the school and your name on the Master Record also. Indicate the student's sex using "1" for boys and "2" for girls. Record their most recent IQ if you have access to it. If there is no record of an IQ, put "M" in the column.

b. Do not mention this grouping arrangement to the students at any time. It is only needed for the analysis of data.

Step 2 a. On Monday, November 9, tell the students about this ten-day "word-building" exercise by reading them the following introduction.

Introduction to the Students

During the next ten school days, we will try to build up our word power by learning the meaning of new words.

Each day I will give each of you a list of words like this (SHOW Study List 1). You may know the meaning of some of these words, but many are quite difficult.

If you want to build your word power, you will probably have to study the meaning of many of these words.

The day after I give you a list of words to study, I will give you a quiz on ten of those same words. We will correct the quiz right away and then I will give you a new list to study for the next day.

Some of these words are very difficult and I do not expect <u>any</u> of you to know all of them. You may learn as many as you want. The mark you get on your quiz each day will <u>not</u> count for your report card; it will not affect your grades in <u>any way</u>. This is simply an exercise to help you learn new words.

Remember, each day for the next ten school days, I will give you a list of 20 words and the following day I will give you a quiz on ten of the words you received the day before.

In the quiz you will be given a word and five possible meanings. You must select the correct meaning. Here is an easy example, (Put on the chalkboard).

<u>large</u> a. high b. big c. slow d. fast e. small

For this one, of course, you would choose answer "b" big. You may study the words any way you want. You may ask someone at home what the words mean, or you may look them up in the dictionary.

b. Pass out the Study List for the first day. Be sure it is marked "<u>Study List 1</u>."

<u>Step 3</u> a. On Tuesday, November 10 , give "Word Quiz 1" in the following way:

<u>Read to STUDENTS</u>: Clear everything off your desk except for a pencil and prepare for our word quiz. Each of you will get an answer sheet like this. When you get your sheet, leave it on your desk until I tell you what to write. (When all students have their sheets, direct them in filling-out the following information at the side; name, school, and instructor.)

Now you will get a quiz sheet like this; put your name on this sheet too, but do not begin working the quiz until I tell you to. (Pass out Word Quiz 1.)

There are ten quiz words on this sheet. The instructions at the top of the sheet say...(Read them).

This means you must do two things for each answer. You must mark your answer on the quiz sheet and on the answer sheet. For example, if you think the first answer is "b" you will draw a circle around the "b" on your quiz sheet and you will darken the "b" space on the answer sheet for the first item; (show the students by pointing to the proper places).

If you change your mind about an answer, be sure to erase both answers. (If there are no questions have the students begin. Give them about five or six minutes. Tell them to ignore the last line with the asterisk.)

b. After the quiz is completed, collect the IBM answer sheets, but not the quiz sheets. Direct the students to exchange papers in some orderly fashion so they can correct each others' papers (e.g., have everyone hand their paper to the student sitting behind them while the last student brings his to the first in the row). Read the answers, using the answer key. Pronounce the underlined word and the answer as well as the letter of the answer. For example: "Construct means C, build." Instruct the students to make a check mark (✓) by the number if the answer is wrong and to make no mark if the answer is right. After all the items have been checked, have the students count the number correct and enter that number in the score box at the top of the page. Have the students return their papers.

Allow a few moments for the students to look over their own work. Then collect all the quiz sheets and distribute Study List 2 for the next day's quiz. At some convenient time, record the scores for each quiz on your Master Record Sheets.

Continue this quiz routine for ten consecutive school days. The last quiz should be given November 23. At the same time you distribute the last quiz, distribute the OPINION SHEET also. Read through the instructions and questions with the children. Direct them to answer them after they complete their quiz. The OPINION SHEET requires NO CORRECTING. Students should be encouraged to answer frankly.

If a student misses a quiz he should not take it at all. Place "M" in his score column for that day. If he is absent when the quiz sheets are passed out, but is present when the quiz is given, he should take the quiz.

IMPORTANT REMINDERS

a. Each day remind the students to use the ten spaces on their IBM answer sheet which correspond to the numbers on the quiz sheet for that day.

b. You do no checking of the IBM answer sheets.

c. Remind students to mark each answer in two places; on the Quiz Sheet and the IBM Answer Sheet.

d. When the students are correcting each others' papers, be sure you read aloud the main word, the letter representing the correct response, and the word which actually best defines the underlined word.

e. BE SURE TO AVOID SHOWING ANY INDICATION OF BEING DISAPPOINTED OR SATISFIED WITH THE STUDENTS' PERFORMANCE ON ANY DAY, AT ANY TIME. AVOID MAKING ANY COMPARISONS BETWEEN CLASSES.

f. Do not allow special time during the day for students to study the words, but do not forbid a student to study them if for some reason he has extra time. Do not tell the students the meaning of any words. They may use anyone other than the teacher as a reference source.

INSTRUCTIONS FOR TEACHER EXPERIMENTERS
FOR PROJECT GAME IV

INTRODUCTION

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We know that teachers can be a great motivating source for students. That is NOT what we want to measure in this experiment. We want to know something about other factors that may or may not be effective motivators.

MATERIALS

In your package of materials you should find the following:

1. Ten sets of pink STUDY LISTS, one set for each of the ten days.

2. Ten sets of yellow QUIZ SHEETS, one set for each of the ten days.

3. One set of IBM answer sheets; a student uses the same answer sheet for all ten days.

4. One Master Record Sheet.

5. 40 packages of Life-Savers.

(Check your materials and call if there is anything missing.)

PROCEDURE

Step 1 a. Divide your students into four equal-sized groups on the basis of general reading ability. You do not need to consult any past records in making this decision; your judgment based on observation is accurate enough. Make the groups as equal in size as possible. For example, if you have 31 students you should have groups of 8, 8, 8, and 7. Call your lowest group 1; your second lowest group 2; the next group 3; and your best group 4. On the Master Record sheets list the members of each group beginning with the lowest group (1); use one page for each group and put names in alphabetical order writing LAST name first. Fill in the name of the school and your name on the Master Record also. Indicate the student's sex using "1" for boys and "2" for girls. Record their most recent IQ if you have access to it. If there is no record of an IQ, put "M" in the column.

b. List these groups on the chalkboard or a bulletin board but do not label them as "high," "low," etc. Call them "Group 1," "Group 2," etc.

Step 2 a. On Monday, November 9, tell the students about this ten-day "word-building" exercise by reading them the following introduction.

Introduction to the Students

During the next ten school days, we will try to build up our word power by learning the meaning of new words.

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Each day I will give each of you a list of words like this (SHOW Study List 1). You may know the meaning of some of these words, but many are quite difficult.

If you want to build your word power, you will probably have to study the meaning of many of these words. The day after I give you a list of words to study, I will give you a quiz on ten of those same words. We will correct the quiz right away and then I will give you a new list to study for the next day.

Some of these words are very difficult and I do not expect any of you to know all of them. You may learn as many as you want. The mark you get on your quiz each day will not affect your grades in any way. This is simply an exercise to help you learn new words.

Remember, each day for the next ten school days, I will give you a list of 20 words and the following day I will give you a quiz on ten of the words you received the day before.

But listen to this: I will divide the class into four groups and each day I will give a package of Life-Savers to the student who gets the highest score in each group. That means we will have four groups and at least four students will win Life-Savers every day for the next ten school days. Listen carefully now so you know who is in your group. (You may read off the names of the students in each group or you may have them listed on the chalkboard and simply refer to the board.)

In the quiz you will be given a word and five possible meanings. You must select the correct meaning. Here is an easy example, (Put on the chalkboard)

large a. high b. big c. slow d. fast e. small

For this one, of course, you would choose answer "b," big. You may study the words any way you want. You may ask someone at home what the words mean, or you may look them up in the dictionary.

b. Pass out the Study List for the first day. Be sure it is marked "Study List 1."

Step 3 a. On Tuesday, November 10, give "Word Quiz 1" in the following way:

Read to STUDENTS: Clear everything off your desk except for a pencil and prepare for our word quiz. Each of you will get an answer sheet like this. When you get your sheet, leave it on your desk until I tell you what to write. (When all students have their sheets, direct them in filling-out the following information at the side: name, school, and instructor.)

Now you will get a quiz sheet like this; put your name on this sheet too, but do not begin working the quiz until I tell you to. (Pass out Word Quiz 1.)

There are ten quiz words on this sheet. The instructions at the top of the sheet say...(Read them.)

This means you must do two things for each answer. You must mark your answer on the quiz sheet and on the answer sheet. For example, if you think the first answer is "b" you will draw a circle around the "b" on your quiz sheet and you will darken the "b" space on the answer sheet for the first item; (show the students by pointing to the proper places).

If you change your mind about an answer, be sure to erase both

answers. (If there are no questions have the students begin. Give them about five or six minutes. Tell them to ignore the last line with the asterisk.)

b. After the quiz is completed, collect the IBM answer sheets, but not the quiz sheets. Direct the students to exchange papers in some orderly fashion so they can correct each others' papers (e.g., have everyone hand their paper to the student sitting behind them while the last student brings his to the first in the row). Read the answers, using the answer key. Pronounce the underlined word and the answer as well as the letter of the answer. For example: "Construct means C, build." Instruct the students to make a check mark (✓) by the number if the answer is wrong and to make no mark if the answer is right. After all the items have been checked, have the students count the number correct and enter that number in the score box at the top of the page. Have the students return their papers. Have group 1 stand while you inquire about the highest scorer in that group. (Suggested procedure: "Does anyone have a score of 10? 9?" etc.) Award the package of Life-Savers and then proceed in the same way with groups 2, 3, and 4. Use the Tie Breakers whenever necessary.

How to Handle a "Tie" -- The Use of "Tie Breakers"

If two or more students tie for high scorer in a group, give each member of the tie a "Tie Breaker" sheet. They are to write their name on the sheet, answer the two items quickly (about one minute), and return the "Tie Breakers" to you. Check and use only the first item to break the tie if possible. The second item is used only if the first item is not sufficient to declare a single winner. In the event that a tie still exists after using the "Tie Breaker," the reward must be shared by the winners.

Distribute "Tie Breakers" to all students needing them in all four groups. Be sure all slips are collected before you check and break a tie in any group. Indicate with an X on the "Tie Breaker" whether the student is a winner or loser in the tie break. Both

are marked "winner" if they are forced to share the candy reward. "Tie Breakers" are the same for each group. They are words which are included in the study lists.

Then collect all the quiz sheets and distribute Study List 2 for the next day's quiz. At some convenient time, record the scores for each quiz on your Master Record sheets.

Continue this quiz routine for ten consecutive school days. The last quiz should be given November 23. At the same time you distribute the last quiz, distribute the OPINION SHEET also. Read through the instructions and questions with the children. Direct them to answer them after they complete their quiz. The OPINION SHEET requires NO CORRECTING. Students should be encouraged to answer frankly.

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5. One TABS game kit.

(Check your materials and call if there is anything missing.)

PROCEDURE

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b. Enter these groups on the TABS game board in the following way: Under the "T" section there are ten name boxes, each identified with a separate color. Using a pencil write the names of the lowest group (Group 1) in these boxes. Put one name in each box, using as many of the ten boxes as needed. Enter the name of students in Group 2 under the "A" section of the board; the names of the students in Group 3 under the "B" section of the board; and the names of the students in Group 4 under the "S" section of the board.

Step 2 a. On Monday, November 9, tell the students about this ten-day "word-building" exercise by reading them the following introduction.

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Some of these words are very difficult and I do not expect any of you to know all of them. You may learn as many as you want. The mark you get on your quiz each day will not count for your report card; it will not affect your grades in any way. This is simply an exercise to help you learn new words.

Remember, each day for the next ten school days, I will give you a list of 20 words and the following day I will give you a quiz on ten of the words you received the day before.

But listen to this: While we try to build our word-power, we will play a game called TABS. Here is how it goes: This board (Show board) is divided into four parts. One part is called "T," one part is called "A," one is called "B," and one is called "S" (point to each section). I have also divided the class into four parts and you will see that your name is written in one of the parts of this board.

Listen carefully now and I will tell you what group you belong to and what color space you have. In group "T" (NAME) has the blue space, (NAME) has the yellow space, (NAME) has the green space, etc. (point to each name as you point out their spot and color).

In group "A" (NAME) has the blue space, (NAME) has the yellow space, (NAME) has the green space, etc. (point to each name as you point out their spot and color).

(In group "B" and group "S" the same procedure is followed as in groups "T" and "A".)

Notice each of you has a special pin which is your special color. This pin is called your marker.

Now here is how the game is played: Each day, after our word-quiz, we will check our papers right away. Then we will see who has the highest score in the "T" group and place his pin in this top spot (point to the first dark square in the scoring column under "T"); whoever is second highest will have his pin placed here (point to the second dark square) then we will place the rest of the pins in the "T" group in these circles (point to the circles under "T"). We will rank the pins according to the scores of the "T" players. Next we will look at the players in the "A" group and rank their pins placing the highest scoring "A" player here (point to the first square under "A"); the second player here (point to the second square) and the third here (point to the first circle in "A" scoring column) and so on. We will do the same thing for the "B" group and the "S" group.

Notice the two highest scoring players in each group have their pins in these dark square spaces. These are called the TABS spots. Each time you get your pin in one of these spots you get a little TAB like this (Show a TAB) to put on your marker. (Demonstrate by sticking the pin through the black paper TAB and pushing it up toward the head of the pin.) These eight TAB winners (point across the board to the eight square spaces) also get a chance to play "double or nothing" <u>if they want to</u>. That means each time you get your pin in one of these eight spaces and win a TAB you have a chance to win <u>another</u> TAB <u>right away</u>. All you have to do is answer correctly one surprise vocabulary word item. This is called the "challenge word;" if you get the challenge word <u>right</u> you win another TAB to put on your pin; <u>BUT</u> if you get the challenge word <u>wrong</u>, you have to take a TAB off your marker.

Remember, you can choose to <u>take</u> or <u>skip</u> the challenge word. You may want to just keep the one TAB you won and not risk losing it. In that case, you simply leave the challenge word go.

We will play this game for ten school days after each word-building quiz and we will see how many TABS you can win. Remember, the way to start winning TABS is to get your marker in one of the two top spaces in your group.

We will keep the same groups for all ten days. You will only be racing against the students in your group.

No matter what score you get on the quiz, if it is the highest in your group, your pin will be placed in the first space. If there are any ties for the highest scores, all players in the tie will win a TAB and get a chance at a challenge word if they want it.

We will start the game tomorrow after our first word quiz. I know many of the words in this list are difficult and I don't expect that you will learn them all but study as many as you wish. There will be 20 words on each study list and you will be tested on ten of them.

In the quiz you will be given a word and five possible meanings. You must select the correct meaning. Here is an easy example, (put on the chalkboard)

<u>large</u> a. high b. big c. slow d. fast e. small

For this one, of course, you would choose answer "b," big. You may study the words any way you want. You may ask someone at home what the words mean, or you may look them up in the dictionary.

b. Pass out the <u>Study List</u> for the first day. Be sure it is marked "<u>Study List 1</u>."

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Now you will get a quiz sheet like this; put your name on this sheet too, but do not begin working the quiz until I tell you to. (Pass out <u>Word Quiz 1</u>.)

There are ten quiz words on this sheet. The instructions at the top of the sheet say...(read them.)

This means you must do <u>two</u> things for each answer. You must mark your answer on the quiz sheet <u>and</u> on the answer sheet. For example, if you think the first answer is "b" you will draw a circle around the "b" on your quiz sheet <u>and</u> you will darken the "b" space on the answer sheet for the first item; (show the students by pointing to the proper places).

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b. After the quiz is completed, collect the IBM <u>answer</u> sheets, but <u>not</u> the quiz sheets. Direct the students to exchange papers in some orderly fashion so they can correct each others' papers (e.g., have everyone hand their paper to the student sitting behind them while the last student brings his to the first in the row.) Read the answers, using the answer key. Pronounce the underlined word and the answer as well as the letter of the answer. For example: "Construct means <u>C</u>, build." Instruct the students to make a check mark (✓) by the number if the answer is wrong and to make <u>no</u> mark if the answer is right. After all the items have been checked, have the students count the number <u>correct</u> and enter that number in the score box at the top of the page. Have the students return their papers so each has his own quiz. Have the"T" group stand while you inquire about their scores and place their pins in rank order on the TABS board. When there is a tie, all the pins involved in the tie are put in one score spot. (Suggested Procedure: "<u>T</u> group stand. Does anyone have a score of ten?" If so place his pin in the top space on the board. "A score of nine?" ...etc.) Follow the same procedure for the "A," "B," and "S" groups until all pins have been ranked

on the score board. Award TABS to the high scorers in each group. Pins for absent students are put in their name boxes.

When there is a tie in either of the first two score spots, TABS are given to all members of the tie and the double or nothing option is also given. For example, if two students have a high score of "6" in the "T" group and two have a score of "5," there will be four students awarded TABS in that group alone. After the pins have been properly placed on the score board, the quiz sheets are to be collected EXCEPT from the TAB winners who choose to play "double or nothing." The TAB winners in all groups must decide at <u>this point</u> whether they want to try the challenge word. Those who decide to take the challenge word KEEP their quiz sheet. After all the other students' sheets have been collected, print the challenge word clearly on the chalkboard and instruct the TAB winners who are playing "double or nothing" to copy the word on the challenge line at the bottom of the quiz sheet. Then they must answer the challenge item and submit their paper to you. If their response is correct, award another TAB; if their response is incorrect, remove a TAB from their pin. (Student help for placing pins and TABS may be used as you see fit.) <u>Study List 2</u> is distributed for the next day's quiz. At some convenient time record the scores for each quiz on your Master Record Sheets.

Continue this quiz routine for ten consecutive school days. The last quiz should be given November 23. At the same time you distribute the last quiz, distribute the OPINION SHEET also. Read through the instructions and questions with the children. Direct them to answer them <u>after</u> they complete their quiz. The OPINION SHEET requires <u>NO CORRECTING</u>. Students should be encouraged to answer frankly.

If a student misses a quiz he should not take it at all. Place "M" in his score column for that day. If he is absent when the quiz sheets are passed out, but is <u>present</u> when the quiz is given, he should take the quiz.

<u>IMPORTANT REMINDERS</u>

a. Each day remind the students to use the ten spaces on their IBM answer sheet which correspond to the numbers on the quiz sheet for that day.

b. You do no checking of the IBM answer sheets.

c. Remind students to mark each answer in two places; on the Quiz Sheet and the IBM Answer Sheet.

d. When the students are correcting each others' papers, be sure you read aloud the main word, the letter representing the correct response, and the word which actually best defines the underlined word.

e. BE SURE TO AVOID SHOWING ANY INDICATION OF BEING DISAPPOINTED OR SATISFIED WITH THE STUDENTS' PERFORMANCE ON ANY DAY, AT ANY TIME. AVOID MAKING ANY COMPARISONS BETWEEN CLASSES.

f. Do not allow special time during the day for students to study the words, but do not forbid a student to study them if for some reason he has extra time. Do not tell the students the meaning of any words. They may use anyone other than the teacher as a reference source.

Study Lists and Word Quizzes

STUDY LIST NUMBER 1

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. budge
2. deteriorate
3. solo
4. gaudy
5. expensive
6. precise
7. dispute
8. reverse
9. construct
10. cancellation
11. universal
12. sanitary
13. consumed
14. apparent
15. prohibit
16. prefer
17. glisten
18. retain
19. disrupt
20. alternate

STUDY LIST NUMBER 2

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. tendency
2. restrict
3. falter
4. absurd
5. link
6. anticipate
7. combination
8. collaborate
9. confident
10. heave
11. disease
12. continuous
13. descend
14. approach
15. demolish
16. accumulate
17. radiation
18. incentive
19. optimal
20. captive

STUDY LIST NUMBER 3

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. arbitrary
2. urge
3. lunge
4. gradually
5. handsome
6. lecture
7. ferocious
8. revolve
9. corridor
10. distinct
11. souvenir
12. exclusive
13. environment
14. spontaneous
15. plunge
16. scheme
17. inspection
18. criticism
19. fatigue
20. proper

STUDY LIST NUMBER 4

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. foundation
2. despise
3. influence
4. substitute
5. reign
6. halt
7. torture
8. accelerate
9. eliminate
10. incidental
11. dismiss
12. astonished
13. vicinity
14. complex
15. token
16. motive
17. complacency
18. colleague
19. flabby
20. indication

STUDY LIST NUMBER 5

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. petrify
2. extensive

3. dominant
4. interaction

5. pursue
6. expand

7. concept
8. rescue

9. pardon
10. partial

11. sufficient
12. menace

13. survive
14. antique

15. certain
16. survey

17. notion
18. rarity

19. utilize
20. rivalry

STUDY LIST NUMBER 6

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. immerse
2. convert

3. complication
4. objective

5. wither
6. remove

7. mature
8. hazard

9. repress
10. eccentric

11. representative
12. immense

13. common
14. dictator

15. shortage
16. attempt

17. grief
18. illustrate

19. marsh
20. foliage

STUDY LIST NUMBER 7

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. caption
2. compilation
3. delegate
4. enormous
5. source
6. curfew
7. mallard
8. boundary
9. concord
10. cautious
11. gratified
12. baffle
13. absent
14. dearth
15. constrain
16. feeble
17. credit
18. internal
19. miniature
20. adequate

STUDY LIST NUMBER 8

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. spectator
2. aimless
3. calculate
4. strenuous
5. condemn
6. strident
7. defeat
8. sorcerer
9. obvious
10. mischief
11. principal
12. plump
13. gorgeous
14. penetrate
15. casualty
16. evaluate
17. colleague
18. vicious
19. endeavor
20. detriment

STUDY LIST NUMBER 9

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. quote
2. protest
3. replenish
4. audacity
5. controversy
6. forlorn
7. clumsy
8. vanish
9. ignoble
10. benign
11. bedlam
12. dawn
13. proverb
14. situation
15. isolate
16. dimensions
17. throng
18. entire
19. request
20. lenient

STUDY LIST NUMBER 10

What do these words mean? Study the ones you want to learn. You will have a quiz on 10 of them. The quiz will not count for your report card, but it will tell you something about your "word power."

1. vagabond
2. relish
3. chariot
4. frequently
5. mimic
6. humid
7. meddle
8. unite
9. agitated
10. collect
11. logical
12. courteous
13. havoc
14. predict
15. circumstance
16. species
17. caldron
18. guarantee
19. porter
20. pietistic

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 1

1. construct	(a) deliver	(b) destroy	(c) build	(d) stack	(e) surround
2. glisten	(a) gnaw	(b) sparkle	(c) grate	(d) sprinkle	(e) speak
3. budge	(a) budget	(b) ignore	(c) bundle	(d) move	(e) hit
4. expensive	(a) rare	(b) high	(c) costly	(d) price	(e) rich
5. prohibit	(a) enjoy	(b) forbid	(c) permit	(d) dread	(e) blockade
6. sanitary	(a) healthful	(b) familiar	(c) similar	(d) pleasant	(e) bright
7. dispute	(a) charge	(b) dismiss	(c) permit	(d) despair	(e) argue
8. consumed	(a) stole	(b) spoiled	(c) hid	(d) divided	(e) devoured
9. prefer	(a) request	(b) favor	(c) charm	(d) seek	(e) like
10. gaudy	(a) flashy	(b) generous	(c) handsome	(d) somber	(e) timid
* _____	(a) give	(b) go	(c) come	(d) keep	(e) show

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 2

11. disease	(a) illness	(b) desire	(c) wound	(d) powder	(e) caretaker
12. captive	(a) leader	(b) caption	(c) prisoner	(d) carpenter	(e) catch
13. link	(a) stab	(b) cut	(c) connect	(d) wire	(e) compare
14. confident	(a) happy	(b) sly	(c) sure	(d) lucky	(e) worried
15. radiation	(a) rainfall	(b) report	(c) revenge	(d) rays	(e) raise
16. approach	(a) leave	(b) advance	(c) overtake	(d) appear	(e) retreat
17. heave	(a) hide	(b) stamp	(c) throw	(d) break	(e) remove
18. absurd	(a) sad	(b) ridiculous	(c) hopeless	(d) dirty	(e) missing
19. accumulate	(a) distribute	(b) collect	(c) loss	(d) donate	(e) hide
20. falter	(a) blame	(b) hesitate	(c) change	(d) drawl	(e) plead
*_____	(a) change	(b) limit	(c) fill	(d) bring	(e) make

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 3

21. handsome	(a) tall	(b) attractive	(c) helpful	(d) honest	(e) unselfish
22. plunge	(a) strip	(b) pluck	(c) play	(d) dive	(e) kick
23. gradually	(a) slowly	(b) politely	(c) swiftly	(d) regularly	(e) proudly
24. proper	(a) sure	(b) correct	(c) positive	(d) proud	(e) choice
25. revolve	(a) solve	(b) dissolve	(c) resolve	(d) spin	(e) swing
26. scheme	(a) scene	(b) mark	(c) group	(d) hurt	(e) plan
27. lunge	(a) thrust	(b) drop	(c) permeate	(d) close	(e) mess
28. souvenir	(a) remembrance	(b) memory	(c) flag	(d) banner	(e) trophy
29. corridor	(a) gateway	(b) fence	(c) hallway	(d) stadium	(e) platform
30. fatigue	(a) overweight	(b) tiredness	(c) tardiness	(d) plenty	(e) circular
*_____	(a) smooth	(b) thin	(c) wild	(d) wet	(e) sorry

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 4

31. halt	(a) raise	(b) stop	(c) ruin	(d) command	(e) strike
32. astonished	(a) grieved	(b) alert	(c) surprised	(d) entertained	(e) happy
33. token	(a) trip	(b) symbol	(c) message	(d) instrument	(e) paper
34. foundation	(a) base	(b) founder	(c) open	(d) path	(e) object
35. flabby	(a) fat	(b) shabby	(c) flashy	(d) short	(e) dizzy
36. dismiss	(a) dissolve	(b) change	(c) sorrow	(d) discharge	(e) deceive
37. torture	(a) castle	(b) agony	(c) treat	(d) boredom	(e) trick
38. reign	(a) pour	(b) sign	(c) rule	(d) show	(e) hide
39. vicinity	(a) neighborhood	(b) victim	(c) county	(d) country	(e) place
40. colleague	(a) dean	(b) employer	(c) ruler	(d) relative	(e) associate
*_____	(a) like	(b) hate	(c) hide	(d) wait	(e) grow

18

82

18

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 5

41. pardon	(a) divide	(b) excuse	(c) request	(d) confess	(e) admit
42. certain	(a) ready	(b) sure	(c) soft	(d) gentle	(e) usual
43. expand	(a) gain	(b) enlarge	(c) depend	(d) blame	(e) repeat
44. antique	(a) expensive	(b) old	(c) broken	(d) weak	(e) dull
45. notion	(a) idea	(b) reason	(c) map	(d) order	(e) question
46. pertrify	(a) command	(b) inspire	(c) harden	(d) thrust	(e) attack
47. rarity	(a) rigid	(b) dreary	(c) drop	(d) scarcity	(e) celebrity
48. pursue	(a) catch	(b) lose	(c) chase	(d) grab	(e) drop
49. menace	(a) treat	(b) threat	(c) relief	(d) memo	(e) penance
50. dominant	(a) ruling	(b) swift	(c) foresee	(d) demonstrate	(e) minor
*_____	(a) steal	(b) draw	(c) cut	(d) save	(e) lose

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 6

51. marsh	(a) jungle	(b) forest	(c) swamp	(d) desert	(e) cliff
52. common	(a) simple	(b) usual	(c) quiet	(d) queer	(e) special
53. illustrate	(a) avoid	(b) favor	(c) accuse	(d) pretend	(e) explain
54. convert	(a) transform	(b) confess	(c) conduct	(d) crash	(e) invert
55. grief	(a) heavy	(b) thick	(c) penalty	(d) sorrow	(e) courage
56. hazard	(a) blizzard	(b) danger	(c) tornado	(d) cyclone	(e) failure
57. immense	(a) wide	(b) huge	(c) long	(d) tall	(e) fast
58. eccentric	(a) huge	(b) heavy	(c) loose	(d) dip	(e) peculiar
59. wither	(a) leave	(b) drop	(c) wave	(d) dry	(e) shake
60. mature	(a) ripe	(b) parent	(c) sickly	(d) melt	(e) freeze
*_____	(a) wind	(b) leaves	(c) sand	(d) stones	(e) water

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 7

61. boundary	(a) country	(b) rope	(c) border	(d) broad	(e) mark
62. cautious	(a) slippery	(b) achieve	(c) strive	(d) careful	(e) mistake
63. absent	(a) missing	(b) void	(c) empty	(d) messy	(e) hollow
64. enormous	(a) fierce	(b) huge	(c) dislike	(d) familiar	(e) bright
65. mallard	(a) club	(b) duck	(c) insect	(d) hammer	(e) staff
66. feeble	(a) fall	(b) dumb	(c) blind	(d) weak	(e) deaf
67. gratified	(a) pleased	(b) provoked	(c) worried	(d) humorous	(e) delayed
68. source	(a) end	(b) middle	(c) place	(d) beginning	(e) goal
69. internal	(a) beside	(b) around	(c) inside	(d) under	(e) over
70. baffle	(a) laugh	(b) perplex	(c) chatter	(d) yell	(e) anger
*_____	(a) tiny	(b) long	(c) big	(d) fat	(e) cold

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 8

71. plump	(a) short	(b) small	(c) tiny	(d) chubby	(e) huge
72. gorgeous	(a) beautiful	(b) warm	(c) smooth	(d) modern	(e) comfortable
73. spectator	(a) helper	(b) observer	(c) dictator	(d) director	(e) loser
74. mischief	(a) horror	(b) sadness	(c) swiftness	(d) naughtiness	(e) humorous
75. obvious	(a) unsure	(b) unknown	(c) evident	(d) unbelieving	(e) slowly
76. sorcerer	(a) magician	(b) pilot	(c) musician	(d) servant	(e) snake
77. penetrate	(a) scrape	(b) carve	(c) pierce	(d) peel	(e) cut
78. condemn	(a) support	(b) assist	(c) pardon	(d) blame	(e) stretch
79. calculate	(a) count	(b) compute	(c) separate	(d) continue	(e) wreck
80. evaluate	(a) empty	(b) fill	(c) perfect	(d) judge	(e) destroy
*_____	(a) cruel	(b) happy	(c) old	(d) dumb	(e) blind

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 9

81. vanish	(a) conquer	(b) shine	(c) disappear	(d) divide	(e) explore
82. dawn	(a) noon	(b) sunrise	(c) sunset	(d) arrive	(e) leave
83. clumsy	(a) clever	(b) quick	(c) awkward	(d) sleepy	(e) moody
84. entire	(a) clothing	(b) complete	(c) repair	(d) solve	(e) part
85. protest	(a) embarrass	(b) change	(c) object	(d) protect	(e) support
86. situation	(a) business	(b) position	(c) time	(d) news	(e) soaked
87. quote	(a) question	(b) repeat	(c) deceive	(d) rhyme	(e) yell
88. replenish	(a) refute	(b) refill	(c) refuse	(d) refuge	(e) remind
89. isolate	(a) island	(b) involve	(c) whisper	(d) hollow	(e) separate
90. proverb	(a) word	(b) title	(c) painting	(d) saying	(e) prophet
*_____	(a) go	(b) give	(c) loan	(d) hold	(e) ask

Find the answer that best explains what the first word in each line means. Circle the letter in front of the word you choose and then darken the proper space on your answer sheet.

NAME _____

SCORE _____ QUIZ 10

91. collect	(a) rob	(b) swap	(c) bargain	(d) hide	(e) gather
92. unite	(a) separate	(b) unit	(c) join	(d) help	(e) soar
93. chariot	(a) angle	(b) plane	(c) coach	(d) church	(e) place
94. guarantee	(a) close	(b) hide	(c) promise	(d) uncover	(e) arrange
95. courteous	(a) smiling	(b) playful	(c) careful	(d) polite	(e) cautious
96. species	(a) occasion	(b) kind	(c) fowl	(d) reptile	(e) unite
97. mimic	(a) imitate	(b) lie	(c) tattle	(d) whisper	(e) chase
98. logical	(a) familiar	(b) reasonable	(c) probable	(d) possible	(e) surprising
99. circumstance	(a) edge	(b) happening	(c) disappointment	(d) partition	(e) place
100. caldron	(a) safe	(b) partition	(c) pit	(d) kettle	(e) trunk
*_____	(a) never	(b) often	(c) always	(d) once	(e) twice

Quiz Answer Key

QUIZ 1

1.	construct	(c) build
2.	glisten	(b) sparkle
3.	budge	(d) move
4.	expensive	(c) costly
5.	prohibit	(b) forbid
6.	sanitary	(a) healthful
7.	dispute	(e) argue
8.	consumed	(e) devoured
9.	prefer	(b) favor
10.	gaudy	(a) flashy

QUIZ 2

11.	disease	(a) illness
12.	captive	(c) prisoner
13.	link	(c) connect
14.	confident	(c) sure
15.	radiation	(d) rays
16.	approach	(b) advance
17.	heave	(c) throw
18.	absurd	(b) ridiculous
19.	accumulate	(b) collect
20.	falter	(b) hesitate

QUIZ 3

21.	handsome	(b) attractive
22.	plunge	(d) dive
23.	gradually	(a) slowly
24.	proper	(b) correct
25.	revolve	(d) spin
26.	scheme	(e) plan
27.	lunge	(a) thrust
28.	souvenir	(a) remembrance
29.	corridor	(c) hallway
30.	fatigue	(b) tiredness

QUIZ 4

31.	halt	(b) stop
32.	astonished	(c) surprised
33.	token	(b) symbol
34.	foundation	(a) base
35.	flabby	(a) fat
36.	dismiss	(d) discharge
37.	torture	(b) agony
38.	reign	(c) rule
39.	vicinity	(a) neighborhood
40.	colleague	(e) associate

QUIZ 5

41.	pardon	(b) excuse
42.	certain	(b) sure
43.	expand	(b) enlarge
44.	antique	(b) old
45.	notion	(a) idea
46.	petrify	(c) harden
47.	rarity	(d) scarcity
48.	pursue	(c) chase
49.	menace	(b) threat
50.	dominant	(a) ruling

QUIZ 6

51.	marsh	(c) swamp
52.	common	(b) usual
53.	illustrate	(e) explain
54.	convert	(a) transform
55.	grief	(d) sorrow
56.	hazard	(b) danger
57.	immense	(b) huge
58.	eccentric	(e) peculiar
59.	wither	(d) dry
60.	mature	(a) ripe

QUIZ 7

61.	boundary	(c) border
62.	cautious	(d) careful
63.	absent	(a) missing
64.	enormous	(b) huge
65.	mallard	(b) duck
66.	feeble	(d) weak
67.	gratified	(a) pleased
68.	source	(d) beginning
69.	internal	(c) inside
70.	baffle	(b) perplex

QUIZ 8

71.	plump	(d) chubby
72.	gorgeous	(a) beautiful
73.	spectator	(b) observer
74.	mischief	(d) naughtiness
75.	obvious	(c) evident
76.	sorcerer	(a) magician
77.	penetrate	(c) pierce
78.	condemn	(b) blame
79.	calculate	(b) compute
80.	evaluate	(d) judge

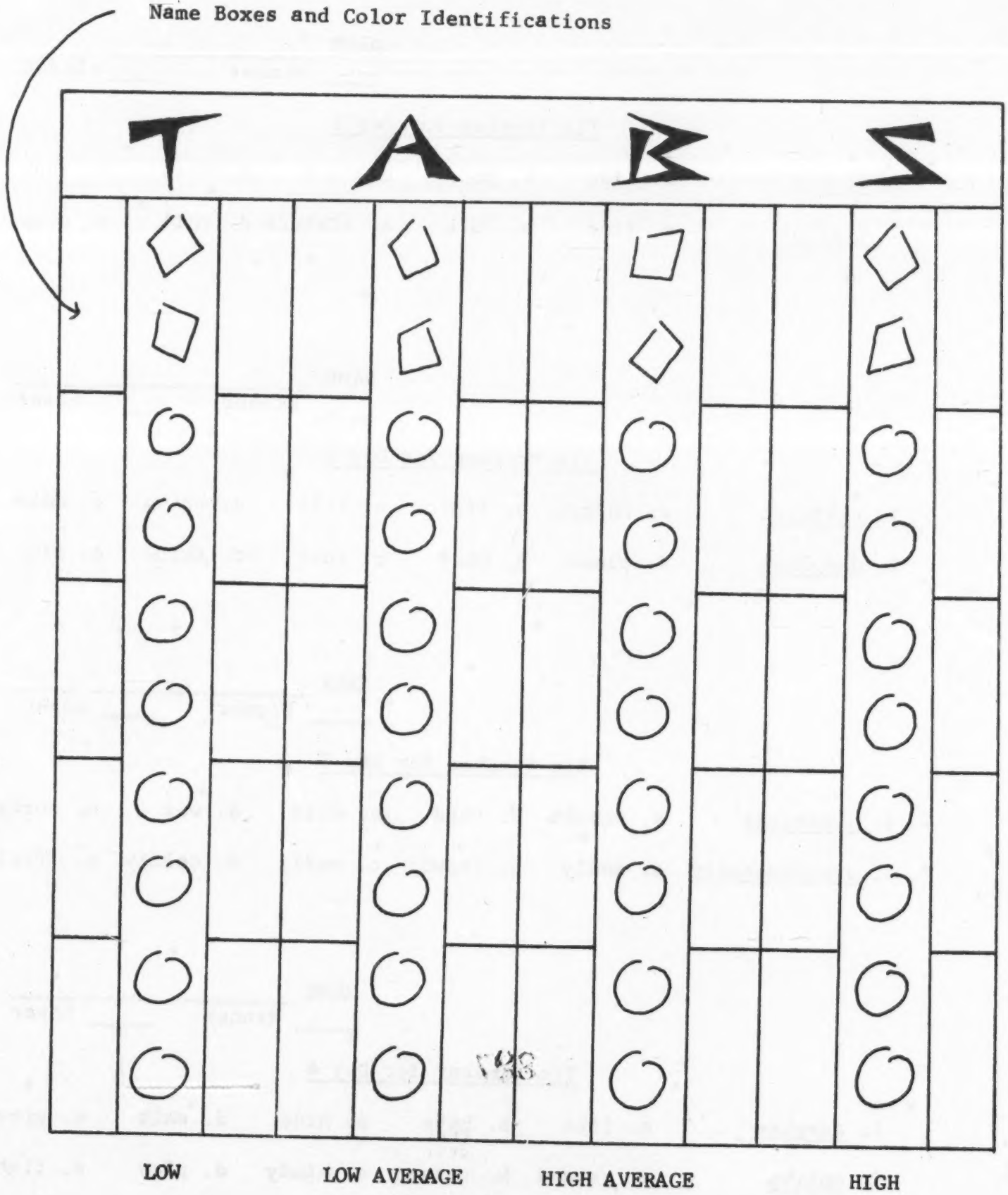
QUIZ 9

81.	vanish	(c) disappear
82.	dawn	(b) sunrise
83.	clumsy	(c) awkward
84.	entire	(b) complete
85.	protest	(c) object
86.	situation	(b) position
87.	quote	(b) repeat
88.	replenish	(b) refill
89.	isolate	(e) separate
90.	proverb	(d) saying

QUIZ 10

91.	collect	(e) gather
92.	unite	(c) join
93.	chariot	(c) coach
94.	guarantee	(c) promise
95.	courteous	(d) polite
96.	species	(b) kind
97.	mimic	(a) imitate
98.	logical	(b) reasonable
99.	circumstance	(b) happening
100.	caldron	(d) kettle

Draft of Game Board (TABS)



Additional Materials for Reward and Game Treatments

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 1

1. retain	a. give	b. go	c. come	d. keep	e. show
2. disrupt	a. find	b. rule	c. disturb	d. roll	e. show

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 2

1. restrict	a. change	b. limit	c. fill	d. bring	e. make
2. demolish	a. place	b. hide	c. ruin	d. shine	e. fix

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 3

1. ferocious	a. smooth	b. thin	c. wild	d. wet	e. sorry
2. spontaneously	a. sadly	b. slowly	c. madly	d. coldly	e. freely

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 4

1. despise	a. like	b. hate	c. hide	d. wait	e. grow
2. motive	a. reward	b. reason	c. study	d. play	e. fight

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NAME _____

_____ Winner _____ Loser

Tie Breaker for ~~Day 5~~

1. <u>rescue</u>	a. steal	b. draw	c. cut	d. save	e. lose
2. <u>concept</u>	a. idea	b. song	c. story	d. letter	e. poem

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 6

1. <u>foliage</u>	a. wind	b. leaves	c. sand	d. stones	e. water
2. <u>attempt</u>	a. fail	b. win	c. race	d. try	e. prize

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 7

1. <u>miniature</u>	a. tiny	b. long	c. big	d. fat	e. cold
2. <u>caption</u>	a. leader	b. story	c. song	d. soldier	e. title

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 8

1. <u>vicious</u>	a. cruel	b. happy	c. old	d. dumb	e. blind
2. <u>casualty</u>	a. accident	b. car	c. train	d. hospital	e. doctor

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 9

1. request	a. go	b. give	c. loan	d. hold	e. ask
2. throng	a. couple	b. room	c. crowd	d. hall	e. stairs

NAME _____

_____ Winner _____ Loser

Tie Breaker for Day 10

1. frequently	a. never	b. often	c. always	d. once	e. twice
2. vagabond	a. director	b. teacher	c. priest	d. clerk	e. tramp

Tie Breaker Answer Key

DAY	WORD	ANSWER
1	retain disrupt	keep disturb
2	restrict demolish	limit ruin
3	ferocious spontaneously	wild freely
4	despise motive	hate reason
5	rescue concept	save idea
6	foliage attempt	leaves try
7	miniature caption	tiny title
8	vicious casualty	cruel accident
9	request throng	ask crowd
10	frequently vagabond	often tramp

Challenge Word Answer Key

DAY	WORD	ANSWER
1	retain	keep
2	restrict	limit
3	ferocious	wild
4	despise	hate
5	rescue	save
6	foliage	leaves
7	miniature	tiny
8	vicious	cruel
9	request	ask
10	frequently	often

Opinion Sheet

NAME _____

OPINION SHEET Please answer these three questions. Say just what you really think!

101. I think this 10-day word-building task was

(a) dull and uninteresting
(b) kind of interesting
(c) very interesting and lots of fun

102. This is how I feel about this word-building task

(a) I wish we never had it
(b) It was OK, but I'm glad it is over
(c) I wish we would keep working the word-building task

103. How many new words do you think you learned with this 10-day word-building task?

(a) none
(b) a few
(c) many

FOLLOW-UP TEST

WORK POWER CHECK-UP

Find the answer that best explains what the first word in each line means. Darken the proper space on your answer sheet.

Name _____

1. construct	(a) deliver	(b) destroy	(c) build	(d) stack	(e) surround
2. glisten	(a) gnaw	(b) sparkle	(c) grate	(d) sprinkle	(e) speck
3. budge	(a) budget	(b) ignore	(c) bundle	(d) move	(e) hit
4. sanitary	(a) healthful	(b) familiar	(c) similar	(d) pleasant	(e) bright
5. dispute	(a) charge	(b) dismiss	(c) permit	(d) despair	(e) argue
6. disease	(a) illness	(b) desire	(c) wound	(d) powder	(e) caretaker
7. link	(a) stab	(b) cut	(c) connect	(d) wire	(e) compare
8. radiation	(a) rainfall	(b) report	(c) revenge	(d) rays	(e) raise
9. approach	(a) leave	(b) advance	(c) overtake	(d) appear	(e) retreat
10. accumulate	(a) distribute	(b) collect	(c) lose	(d) donate	(e) hide
11. handsome	(a) tall	(b) attractive	(c) helpful	(d) honest	(e) unselfish
12. proper	(a) sure	(b) correct	(c) positive	(d) proud	(e) choice
13. revolve	(a) solve	(b) dissolve	(c) resolve	(d) spin	(e) swing
14. scheme	(a) scene	(b) mark	(c) group	(d) hurt	(e) plan
15. souvenir	(a) remembrance	(b) memory	(c) flag	(d) banner	(e) trophy
16. halt	(a) raise	(b) stop	(c) ruin	(d) command	(e) strike
17. foundation	(a) base	(b) founder	(c) open	(d) path	(e) object
18. dismiss	(a) dissolve	(b) change	(c) sorrow	(d) discharge	(e) deceive
19. torture	(a) castle	(b) agony	(c) treat	(d) boredom	(e) trick
20. vicinity	(a) neighborhood	(b) victim	(c) county	(d) country	(e) place
21. pardon	(a) divide	(b) excuse	(c) request	(d) confess	(e) admit
22. certain	(a) ready	(b) sure	(c) soft	(d) gentle	(e) usual
23. notion	(a) idea	(b) reason	(c) map	(d) order	(e) question
24. rarity	(a) rigid	(b) dreary	(c) crop	(d) scarcity	(e) celebrity
25. pursue	(a) catch	(b) lose	(c) chase	(d) grab	(e) drop
26. marsh	(a) jungle	(b) forest	(c) swamp	(d) desert	(e) cliff
27. grief	(a) heavy	(b) thick	(c) penalty	(d) sorrow	(e) courage
28. hazard	(a) blizzard	(b) danger	(c) tornado	(d) cyclone	(e) failure
29. immense	(a) wide	(b) huge	(c) long	(d) tall	(e) fast
30. convert	(a) transform	(b) confess	(c) conduct	(d) crash	(e) invert
31. boundary	(a) country	(b) rope	(c) border	(d) broad	(e) mark
32. cautious	(a) slippery	(b) achieve	(c) strive	(d) careful	(e) mistake
33. enormous	(a) fierce	(b) huge	(c) dislike	(d) familiar	(e) bright

34. source	(a) end	(b) middle	(c) place	(d) beginning	(e) goal
35. internal	(a) beside	(b) around	(c) inside	(d) under	(e) over
36. plump	(a) short	(b) small	(c) tiny	(d) chubby	(e) huge
37. gorgeous	(a) beautiful	(b) warm	(c) smooth	(d) modern	(e) comfortable
38. sorcerer	(a) magician	(b) pilot	(c) muscian	(d) servant	(e) snake
39. calculate	(a) count	(b) compute	(c) separate	(d) continue	(e) wreck
40. evaluate	(a) empty	(b) fill	(c) perfect	(d) judge	(e) destroy
41. vanish	(a) conquer	(b) shine	(c) disappear	(d) divide	(e) explore
42. clumsy	(a) clever	(b) quick	(c) awkward	(d) sleepy	(e) moody
43. entire	(a) clothing	(b) complete	(c) repair	(d) solve	(e) part
44. protest	(a) embarrass	(b) change	(c) object	(d) protect	(e) support
45. situation	(a) business	(b) position	(c) time	(d) news	(e) soaked
46. collect	(a) rob	(b) swap	(c) bargain	(d) hide	(e) gather
47. unite	(a) separate	(b) unit	(c) join	(d) help	(e) soar
48. chariot	(a) angel	(b) plane	(c) coach	(d) church	(e) place
49. species	(a) occasion	(b) kind	(c) fowl	(d) reptile	(e) unite
50. caldron	(a) safe	(b) partition	(c) pit	(d) kettle	(e) trunk

RECORD FORM

MASTER RECORD GROUP _____ SCHOOL _____ INSTRUCTOR _____ CODE NO._____

NAME (Last) (First)	Sex	IQ	1	2	3	4	5	6	7	8	9	10
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												

END

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